
SUMMARY REPORT
of the
NATIONAL DIALOGUE
on the
EPA DRAFT REPORT ON THE ENVIRONMENT 2003

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Final Report
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NATIONAL DIALOGUE SUMMARY REPORT

I. INTRODUCTION

Background

In June of 2003, the U.S. Environmental Protection Agency (EPA) published its first national report on the environment (ROE). This publication consisted of two separate, but related documents—the *Draft Report on the Environment 2003 Technical Document* (referred to as the “Technical Report”), developed for a scientific audience; and the *Draft Report on the Environment 2003*, referred to as the “Public Report,” developed for environmental decision-makers and the public.

A Steering Committee of EPA Program and Regional representatives, directed by Administrator Whitman’s Chief of Staff, oversaw development of the reports. The Office of Research and Development (ORD) and the Office of Environmental Information (OEI) co-led the ROE effort. There were 143 indicators identified and used in the Technical Report, addressing various aspects of health and the environment. The indicators were based on already published or publically available data, and were peer reviewed through an EPA defined, external-expert process. More than half of the data came from sources outside of EPA. The Public Report was derived from a selection of the indicators in the Technical Report, with some additional information added for clarity and readability by a more general audience. In the fall of 2003, OEI initiated a process to gain feedback on the ROE documents. This National Dialogue Summary Report presents a summation of the feedback.

Overview of the National Dialogue

OEI conceived of a series of public meetings around the country that would involve representatives of various EPA stakeholder groups and other interested parties. Six meetings were held between November 2003 and February 2004—in Chicago (EPA Region 5), Atlanta (EPA Region 4), San Francisco (EPA Region 9), Seattle (EPA Region 10), Dallas (EPA Region 6), and Philadelphia (EPA Region 3). OEI announced these meetings in two Federal Register notices (<http://www.gpoaccess.gov/fr/>) and also solicited feedback on the ROE via a website (www.epa.gov/indicators/). These meetings and the opportunity to provide feedback via the website collectively comprise the “National Dialogue.”

“A national dialogue would be useful to talk about how to interpret the data. What does healthy biological condition mean? What should the reference condition (e.g., pristine condition) be?”

Seattle (R10) Participant

Between 65 and 90 stakeholders, representing state, federal, local, and tribal governments; non-profit organizations; academia; and industry were invited to each National Dialogue session. The Federal Register announcements were used to reach other interested parties. Each day-long facilitated meeting ultimately consisted of 30-50 participants, including attendees who responded to the Federal Register

notice and representatives from EPA Headquarters and the EPA Regional Office hosting the meeting. Attendance at the meetings is summarized in Exhibit 1.

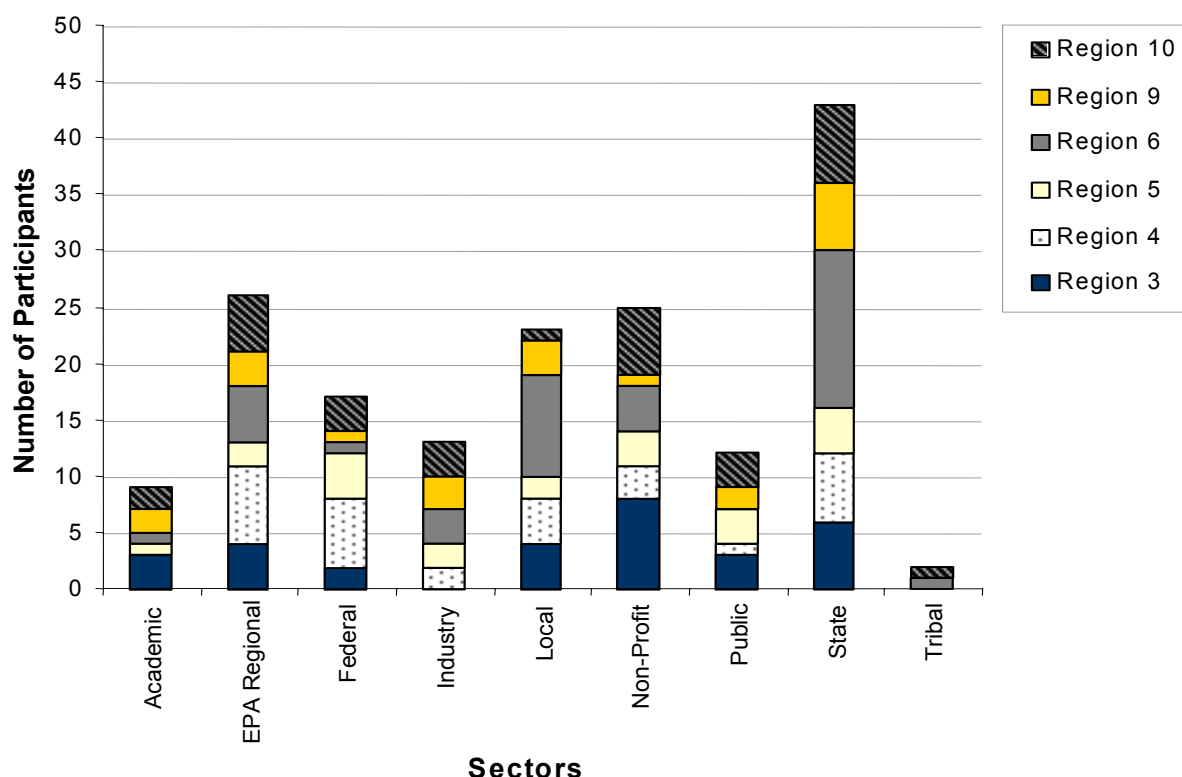


Exhibit 1: Participants in the National Dialogue

EPA’s Assistant Administrator of OEI and Chief Information Officer—Kimberly T. Nelson or her Deputy, Ramona Trovato or Linda Travers—provided opening comments and an overview of the ROE at each meeting. A representative of the Office of the Chief Financial Officer (OCFO) was present and formally presented EPA’s current thinking about alignment of the ROE and the Agency’s strategic planning process. A representative of ORD also provided expertise as needed. For the majority of each meeting, participants engaged in a discussion around questions, such as the following:

- What is your overall opinion of the report?
- Did the organization of the report work (e.g., media and “outcome” chapters)?
- What should be done differently, if anything?
- What else does EPA need to do or consider in the development of the next version of this report?
- How often should a report be generated and in what medium (e.g., hard copy, web)?
- Are the questions posed in the report the right ones? If not, what should they be?
- What are the gaps?
- How well are the questions answered by the indicators?
- Are there other indicators that could answer the questions?
- Are there specific indicators at regional, state, or local scales that are more useful than what was reported? What are they?
- How has the report been or might it be used?
- What key issues must be addressed to align strategic planning with environmental indicators?

Type of Feedback Received

The feedback received in the National Dialogue was thoughtful, varied, and overwhelmingly supportive of EPA's ROE effort. Numerous participants praised the ROE and EPA's initiative in tackling such a daunting task. While many offered constructive criticism, they also acknowledged the challenges of producing such a report. As one participant said: "The ROE is a solid first effort and would receive an 'A' for effort. The product itself would receive a B- or C+ grade. It is good for a first effort." Another participant noted, "The EPA did a great job and are brave souls for doing the ROE."

Many participants were appreciative that EPA asked their opinion and that they had the opportunity to engage in a face-to-face discussion to offer comments as part of the National Dialogue. Some of the meetings ended with attendees requesting each other's contact information with the intent of continuing the conversation on indicators. In addition, offers were made to work with EPA in developing the next version of the ROE.

There were numerous suggestions at different meetings for enhancements or additions to existing topics, such as coastal and marine environment, energy, groundwater, and environmental justice. Common themes heard in several meetings included:

- The ROE is an important and challenging endeavor;
- The ROE will serve as valuable benchmark that needs to be repeated periodically;
- The audience and purpose of the ROE need to be clarified;
- A ROE must be credible, objective, and honest in presenting the facts (the absence of climate change undermined the credibility of the entire document);
- The ROE should be more readily searchable (e.g., put on the web); and
- EPA should build on or at least acknowledge other ROE efforts at regional, state, and local levels.

Indicator Ideas

"There might be consideration given to an indicator on "risky behavior" (e.g., people building in flood plains and the urban-wildland fringe fire issues). These have impacts on land cover and ecosystems."

Chicago (R5) Participant

The comments summarized in the remainder of this document are taken directly from the National Dialogue sessions and from the comments received on the EPA Indicators website (www.epa.gov/indicators/) between October 15, 2003 (publication date of the Federal Register notice about the National Dialogue) and February 29, 2004.

Organization of This Report

The opinions offered during the National Dialogue sessions were diverse and widely varying. During the course of listening to and processing the comments, a framework for organizing the feedback emerged. The following discussion outlines a sequencing path for consideration of the comments.

The themes and ideas that resulted from the meetings point out several issues that must be addressed by EPA. Key among these issues is the need to clarify and publicly communicate the purpose(s), audience(s), and use(s) for the ROE. Purpose, audience, and use collectively define the overall function(s) of the ROE. Multiple functions are possible, as many audiences and uses overlap. While

EPA conceived the first ROE as a set of multi-function documents, the community (as represented by the National Dialogue participants) had a difficult time understanding the purpose and audience(s) for them. Once function is determined, the form of the “products” and the process(es) for producing the various products can be discussed. Exhibit 2 schematically depicts the flow of activities to be addressed as part of the ROE effort. These activities are described in more detail below.

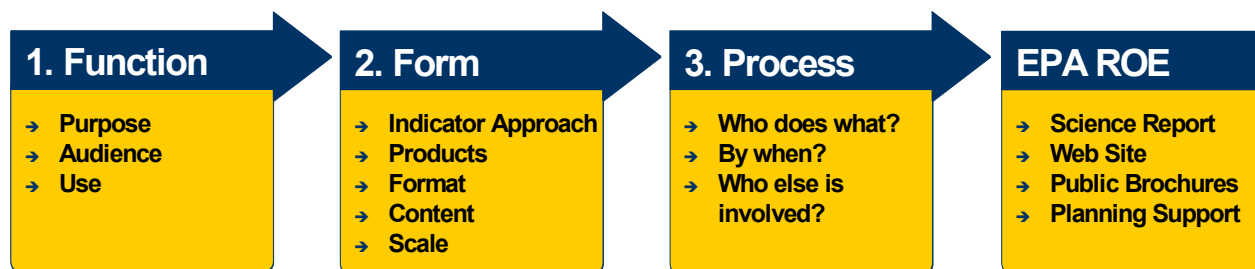


Exhibit 2: Major Activities in Development of the EPA ROE

Clarify Function

Clarify the purpose(s), audience(s), and use(s) for the ROE (e.g., science baseline, progress report on environmental protection efforts, document to support decision-making, report on indicators and gaps, and/or means to influence public behavior).

Determine Form

Based on the function (purpose, audience, use), address the following:

- What indicator structure/approach should be used (e.g., stressors, effects, risks, media, outcomes)?
- What content should be included (e.g., air, water, land, energy, chemicals, health)?
- What format works best (e.g., number and type of documents/frequency, scorecard, web, databases, graphics)?
- What scale, both spatial and temporal, is needed (e.g., global, national, regional, state, local, past, future)?

Establish Process

Establish a process to produce the “forms” identified above that also ensures objectivity and opportunities for engagement by appropriate partners (e.g., indicator selection, writing responsibilities, peer review, regional/state partnerships). EPA’s ability to clearly articulate the intended functions of the ROE will provide a better understanding of the form(s) the effort should take and the processes that might be used or followed for producing those output products, including who needs to be involved in what discussions at specific points in time.

Communicating a clearly stated function for the ROE to the National Dialogue participants and other interested parties will not only improve the value of the ROE, but will also let participants and responders know that their comments were heard. Exhibit 3 provides a more specific example of the interconnectedness of function, form, and process.

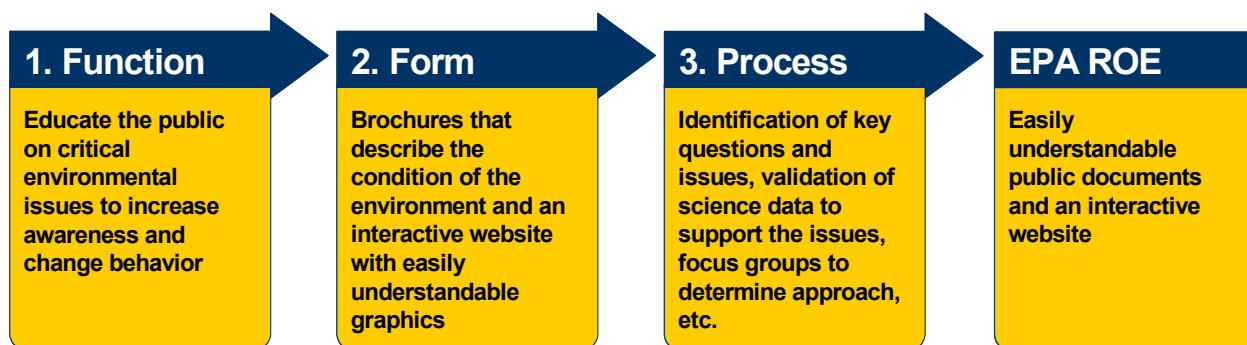


Exhibit 3: Example of the Steps in Development of the ROE for a Public Audience

The remainder of this document summarizes the comments and ideas presented during the National Dialogue sessions. These ideas are organized under chapters addressing Function, Form, and Process. Additionally, the last chapter summarizes recommended next steps for EPA in generation of a future ROE. Text boxes are used to highlight some of the suggestions made during the National Dialogue, and to organize and present information from different meetings that addressed a common topic. The original meeting summaries are included as Appendices A-F. Specific comments on ROE chapters are summarized in Appendix G. Comments on state activities are summarized in Appendix H.

Indicator Ideas

“From a public perspective, indicators that people can relate to on a personal level, such as ‘what has happened to all of the frogs?’ would be the most useful.”

Dallas (R6) Participant

II. FUNCTION OF A “REPORT ON THE ENVIRONMENT”

Function (noun): the action for which a person or thing is specially fitted or used or for which a thing exists. Merriam-Webster Online Dictionary (www.merriam-webster.com)

At every meeting conducted during the National Dialogue, questions were raised about the purpose, audience, and use for the ROE. Participants expressed difficulty in offering specific recommendations on the document(s) without understanding the purpose EPA had in mind in publishing the ROE. Many of the suggestions offered for changes in a future ROE, such as new topics, indicators, gaps, issues, frequency, document structure, and format were based on varying perceptions on the intended purpose. For the sake of discussion, the inter-related concepts of purpose, audience, and use will be discussed under the concept of “function,” which fundamentally addresses the question: What is the ROE for? Examples of the types of purposes, audiences, and uses for an ROE are displayed in Exhibit 4.

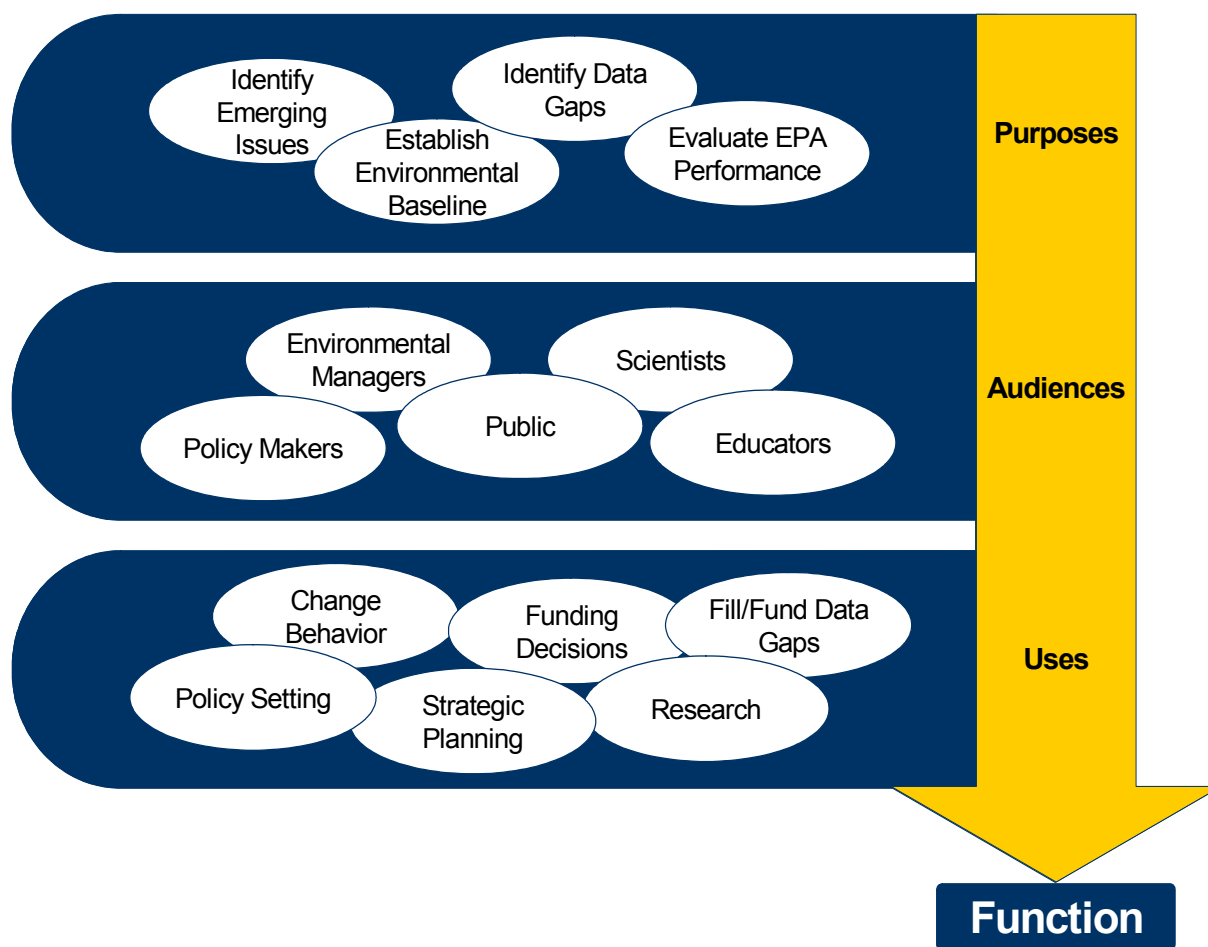


Exhibit 4: Components of the Function of the ROE

The following section summarizes comments offered during the National Dialogue related to the issue of the function of the ROE. The second section offers options for EPA consideration in taking the critical step of clarifying the ROE function.

National Dialogue Comments on Function

Participants at all of the National Dialogue sessions expressed a desire for EPA to clearly identify the intended function (purpose, audience, and use) of the ROE. This desire was expressed by one participant's series of questions: "Is the ROE a State of the Environment Report or a State of the Environmental Infrastructure Report? Will the document propose solutions? Is the document to be used to evaluate EPA?" Another participant offered: "To increase usability the EPA must be clear on the framework, scope, and audience of the ROE. The audience should be those who deal with national level policy." Examples of other specific comments heard during all of the National Dialogue sessions are listed below. The diversity of opinions on function is apparent.

- "If EPA is going to do a 'Report on the Environment,' it should include all environments (e.g., forests, rangelands, grasslands). This report should not just be about EPA's mission."
- "There are other federal agency efforts to report on the environment (e.g, National Water Quality Assessment, EMAP, National Park Service documents), so EPA does not have to cover everything."
- "EPA should think of the ROE as a comprehensive national report on the environment, rather than as an EPA-centric report"
- "The audience is not clear, whether it is the "American public" or resource managers."
- "Who is the target audience? Who should it be? It appears to be about an eighth grade level. Ideally, this information should be available to highly-educated individuals who shape policy and do science."
- "It is difficult to understand the indicators without knowing the purpose of the document. It is also hard to assess the document without identifying who will use the document."
- "The ROE is a curious combination of general information and vignettes of specific information. It is unclear who would read the ROE."
- "EPA's recognition of the need to make environmental indicators 'more understandable and usable' for the public is valuable."
- "It is a broad report that is an excellent first attempt to establish critical baselines. From these baselines, trends can be developed with more scientific data. This is a long-term process."
- "Better linkages between indicators and EPA activities would be good."
- "The report reads as if it has two different purposes—a report on the national environment and EPA's effect on the national environment."
- "This document should be looked at as a national benchmark. This is the first report that tries to set national benchmarks."
- "The ROE effort is great and focusing on environmental results is important. EPA's use for the ROE is unclear. Is it to motivate? Is it to be objective? It is difficult to produce a scientifically credible document without pushing an agenda. It is unlikely that this document will be useful at a local level, however, it should prove useful for the EPA."

Indicator Ideas

"The document should not have omitted climate change. The dialogue here should be about how to represent the results of climate change, not whether it should be represented. The discussion should be about the relative roles of advocates and scientists in the climate change dialogue, but that dialogue cannot take place because nothing is in the report. There is a difference between an information gap and a political motivation. The basic science of climate change is no longer controversial. It is EPA's responsibility to rise above political motivation and publish the science first. The talk about what to do about it can come later. This is a state of the environment report (not linked to outcomes or what to do), and that gives the EPA license to publish climate change science. EPA doesn't have to be on the front lines."

Seattle (R10) Participant

Summary of Potential Purposes Based on National Dialogue Feedback

Based on the comments listed above, four potential purposes are described in the following sections. Comments from the National Dialogue on audiences and uses are intertwined with purposes. The purpose of the ROE is (or could be) to:

- Establish a baseline for current national environmental conditions (including past trends where available);
- Identify and characterize indicator, data collection, monitoring, and analytical gaps;
- Identify and track emerging environmental issues; and/or
- Evaluate EPA performance in environmental protection.

Exhibit 5 depicts a way of conceptualizing the relationship among purpose, audience, and use.

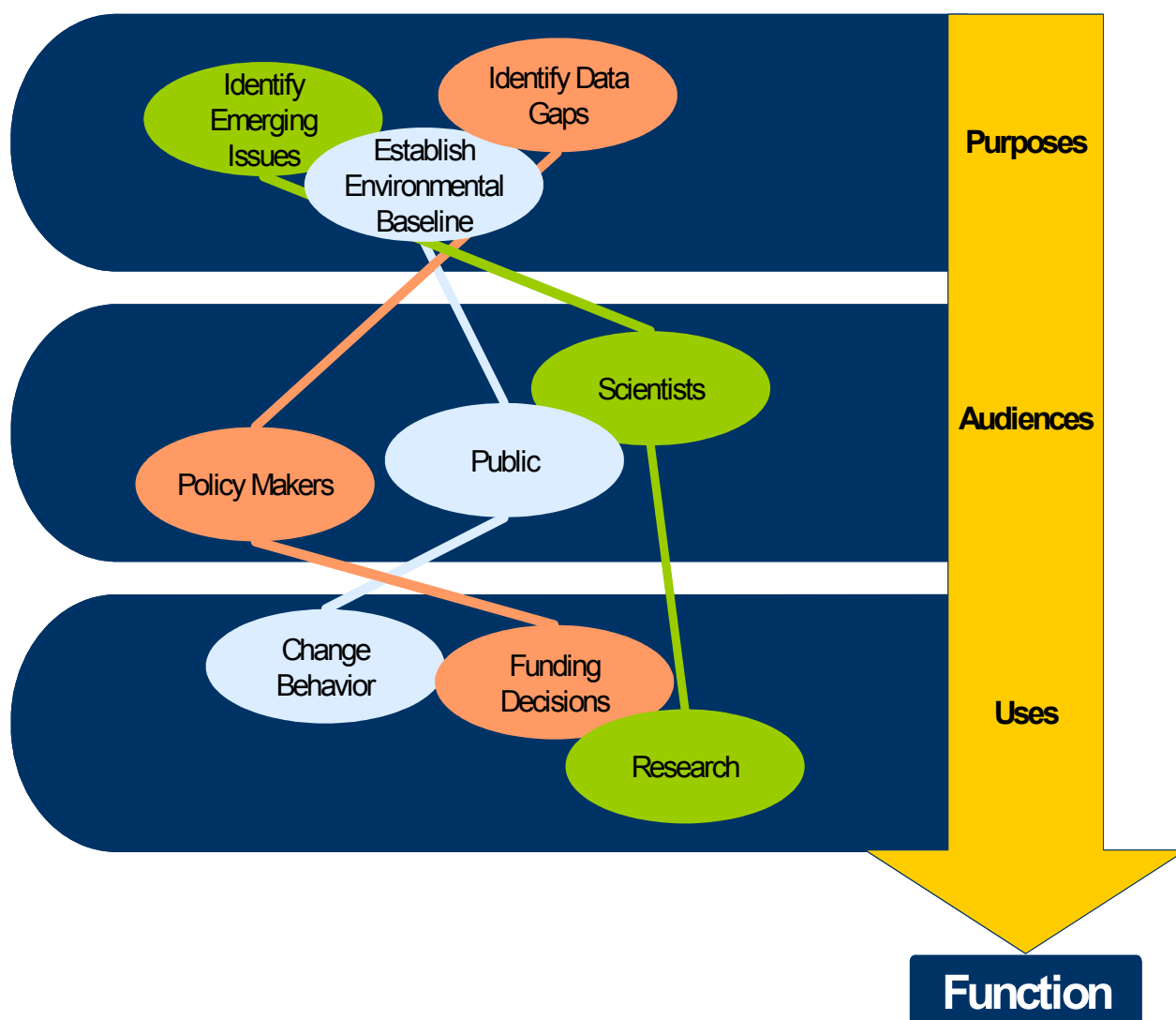


Exhibit 5: Examples of Possible Functions for the ROE

Potential ROE Purpose: Establish an Environmental Baseline

Many participants expressed an interest in the ROE providing a baseline of scientific data on the environment. Baseline data would provide a basis for quantitative comparison to other data sets. State representatives indicated an interest in comparing their state measures to national measures. Others indicated an interest in comparing the U.S. to other nations. State representatives indicated the ROE would be useful to assess and rank priority conditions across states, to assist with requests for resources from state legislatures, and for more effective resource allocation. Local communities identified a need for a report to help set context as a reference for their grant applications to identify appropriate measures. The public expressed an interest in a reference for understanding environmental conditions and the effects of their actions.

Participants noted that establishing benchmarks and comparisons across the country, and of the U.S. with the rest of the world, will assist in identifying important national data and trends. Concerns were expressed, however, about some of the indicators relying on data that were presented relative to a standard. One example offered was the indicator noting “Number of Days with Air Quality Index > 100.” Participants said these data are not as useful as basic information about ambient conditions or pollutant levels. A participant noted that, “These data can be misleading because standards change and different parts of the country will vary significantly.” Other participants noted that, some populations are more at risk for different concentrations of pollutants than others.” Some indicators did not help readers understand baseline conditions. For example, one participant asked: “what do ‘good, fair, and poor’ mean in Exhibit 2-1 of the Public Report, describing the condition of estuaries and the Great Lakes?”

Clarity is needed in establishing a definition of “baseline.” There was interest in using the ROE as a “yard stick” to help identify future goals. One participant asked: “Where could we be in 30 years if this trend continues?” Others observed, however, that if the purpose of the ROE is to provide baseline information, then inclusion of goals and future conditions is not appropriate.

Indicator Ideas

“There needs to be a way that the ROE identifies what is important (i.e., a teaspoon of plutonium v. manure). It would be good to include priority areas needing cleanup. While the aggregate data are important, there is also a need to have the environmental hot spots. A potential indicator of hot spots is looking at the map of where the most activists are and this is a hotspot. This indicator would identify where the environmental issues are and where things are not working.”

Seattle (R10) Participant

For some National Dialogue participants, the interest in an environmental baseline was for education purposes, including the use of the document as a teaching and learning tool. Participants stated: “The ROE will be a good tool to empower people to think about environmental issues in an educational setting;” and “This is a good tool to use with a group of students interested in subjects such as ecotoxicology;” and “EPA should consider how to get the ROE into high schools.” A caveat was added however, that “the fact that global climate change is not discussed makes it problematic to use in an educational setting.”

Potential ROE Purpose: Identify and Characterize Gaps

A second purpose for the ROE suggested by participants’ comments was as a tool for identifying environmental data collection and monitoring gaps. Identification of such gaps could help set national and EPA monitoring policy. One participant stated: “When read, a lot of the value of the report is in identifying the gaps of knowledge.” Another participant noted that: “The ROE could be used in state-

level regulatory agencies to highlight where state-level cooperation must occur [to fill knowledge gaps] (e.g., between environmental agencies and agricultural agencies).”

Some participants thought that the potential field of indicators should be carefully assessed and narrowed to identify those that EPA can use to measure and track the state of the environment, and support improved environmental decision making. Participants at several of the National Dialogue sessions expressed interest in being able to compare indicators from different scales (local and national) and mentioned that a potential outcome of the ROE would be the standardization of the collection of local/state level monitoring data (even if only around priority indicators/measurements). It was suggested that the ROE be used by organizations, in addition to EPA, to begin to align and prioritize monitoring efforts.

Several local and state participants remarked that the ROE process had either “kick-started” their own monitoring efforts, or had served as a “validation” of the importance of their indicator initiatives. To quote from a session: “Knowing that EPA is working on indicators is serving as a motivation for the state.” Participants also commented that EPA should continue to try to align, standardize, and coordinate with state efforts. This alignment “should be done carefully with the proper identity of points of collaboration to assure continuity.”

Potential ROE Purpose: Identify and Track Emerging Issues

Participants commented that the ROE should be used as a means to track emerging environmental issues. Other participants noted that as EPA works to refine the selected environmental indicators and to collect the data necessary to support them, it is equally important to heed what the indicators are saying about the health of the environment. Pressing environmental issues should be identified and addressed by committing the Agency’s resources through its Strategic Plan.

Participants pointed out the need to identify what has been left out of the document, and that identifying emerging environmental issues may be a way to do this. EPA could discuss its plans for research on emerging issues. Participants noted that, “There is a need to make sure the important emerging issues are prioritized, rather than simply falling back on the same old measures for which data are available.” One comment specifically stated that emerging issues—such as pharmaceuticals and hormones in water supplies, and nano-technology—should be considered.

It was observed that the reports that the Council on Environmental Quality (CEQ) produced in the past did an excellent job of describing status and trends and identifying emerging issues. They were intended to prompt federal action on these issues. One participant noted that, “An option for the ROE is to create [reports] annually, but shift the spotlight each year.” Other participants noted, however, that continuity in reporting is important and that the CEQ approach of addressing different issues every year made it difficult to track trends and issues across years. A suggestion was offered to consider the ROE as a tool and driver for making changes in environmental protection, with a section that would address “where we need to go from here.”

Potential ROE Purpose: Evaluate EPA Performance

Part of the discussion during each of the National Dialogue sessions was on the use of the ROE by EPA in its strategic planning efforts. This led to several comments about the relevance of the ROE in measuring or assessing EPA’s performance. Opinions in each session were diverse, as shown in the following list of specific comments:

- “The ROE does not need a discussion of laws.”
- “There is no information on EPA initiatives, which seems strange in a report published by the EPA.”
- “It should be clear what indicators relate to EPA’s scope of work, strategic planning efforts, performance obligations, etc. This is regardless of whether the scope of the report spans beyond areas that fall within EPA’s purview.”
- “For EPA management purposes, it would be beneficial to use the indicators to identify where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past.”
- “Including performance that is tied to the budget would strengthen the report, but EPA would have to include this only for issues over which it has responsibility/authority and some measure of control.”
- “Somehow what is being tracked needs to be connected with planning and performance.”
- “The document simply presents data without providing a sense of purpose toward improving the quality of the environment. It would be useful to have some specific examples (e.g., when EPA did this (AQ standards), the result was this (reduction in pollutants)).”
- “Indicators should be chosen relative to EPA goals.”
- “The ROE should be lined up with EPA strategic planning.”

Other suggestions during the National Dialogue included conducting an assessment to better understand the effects of EPA’s decisions on the environmental conditions being measured. Some participants suggested that emphasizing EPA’s progress would also provide an opportunity to discuss causes of environmental problems.

Recommendations on ROE Function

As described above, there was general confusion on the function (purpose, audience, and use) of EPA’s 2003 ROE and several different functions were suggested during the course of the National Dialogue sessions. National Dialogue participants asked EPA to more clearly articulate its intended purpose(s), audience(s), and use(s) for the ROE. In the 2003 ROE, EPA described multiple functions, as noted below:

Public Report Executive Summary: *“The report describes what EPA knows - and doesn’t - about the current state of the environment at the national level, and how the environment is changing. The report highlights the progress our nation has made in protecting its air, water, and land resources...EPA welcomes your suggestions about how well this report communicates environmental status and trends and how to better measure and manage for environmental results.”*

Technical Report Preface: *“...EPA has launched a multi-year effort to improve the state of the science and our knowledge of the state of the environment.....we look forward to collaborating with federal and state agencies to promote integrated and coherent approaches and mechanisms for reporting on the state of the environment....to explore how best to improve our ability to measure and assess environmental conditions....to focus our resources on the areas of greatest concern and to manage our work to achieve measurable results.”*

Technical Report Introduction: *“The report would represent the first step ... to better measure and report on progress toward environmental and human health goals and to ensure the Agency’s accountability to the public.”*

With the exception of acknowledging federal and state agencies, neither report clearly identifies the intended audience for the documents, nor how any audience might make use of the documents. Participants who examined the Technical Report understood that EPA has other reports and documents that are used to discuss EPA strategies and goals. Suggestions were made that this should be made clear in the Public Report as well. Readers could benefit by knowing how the indicator effort fits into other processes that EPA has for developing performance measures and incorporating those measures into internal planning efforts.

National Dialogue participants have acknowledged that EPA has initiated a valuable and important endeavor. Clearly articulating what EPA is hoping to accomplish for whom is an essential first step in moving forward. All of the functions for the ROE, both implied by EPA and discussed during the National Dialogue, are worth further consideration. Different functions, however, will be best supported by different products and through different partnerships. The immediate task in the evolution of EPA's next ROE and its indicator initiative is to clearly define and communicate the function of the ROE, including the purpose(s), audience(s), and use(s). Statements should be included on function in whatever publications comprise the ROE.

III. FORM OF A “REPORT ON THE ENVIRONMENT”

Form (noun): the shape and structure of something as distinguished from its material.
Merriam-Webster Online Dictionary (www.merriam-webster.com)

As noted above, form does not necessarily include the composition of an object. For the sake of organization, however, the comments offered on content during the National Dialogue are included under this discussion of form. Also included are the observations made by participants on indicator structure/approach, formats, and scale.

Clarity on the function of the ROE will greatly ease the process of addressing the “form” of the effort. For example, in some of the National Dialogue sessions, the question was raised on the use of the ROE by the general public. If use by the public was EPA’s intent, National Dialogue participants suggested including information on how each indicator relates to individual behavior and how the layperson can learn more and do something about their environmental issues of interest. Such a purpose and use might mean that the “form,” including format and content, would be a simple brochure on “environmental citizenship.” This would include information for each indicator such as: “What this means for you,” and “What you can do about it.”

The form of the ROE should support its function. Exhibit 6 depicts examples of different forms that might result from different ROE functions.

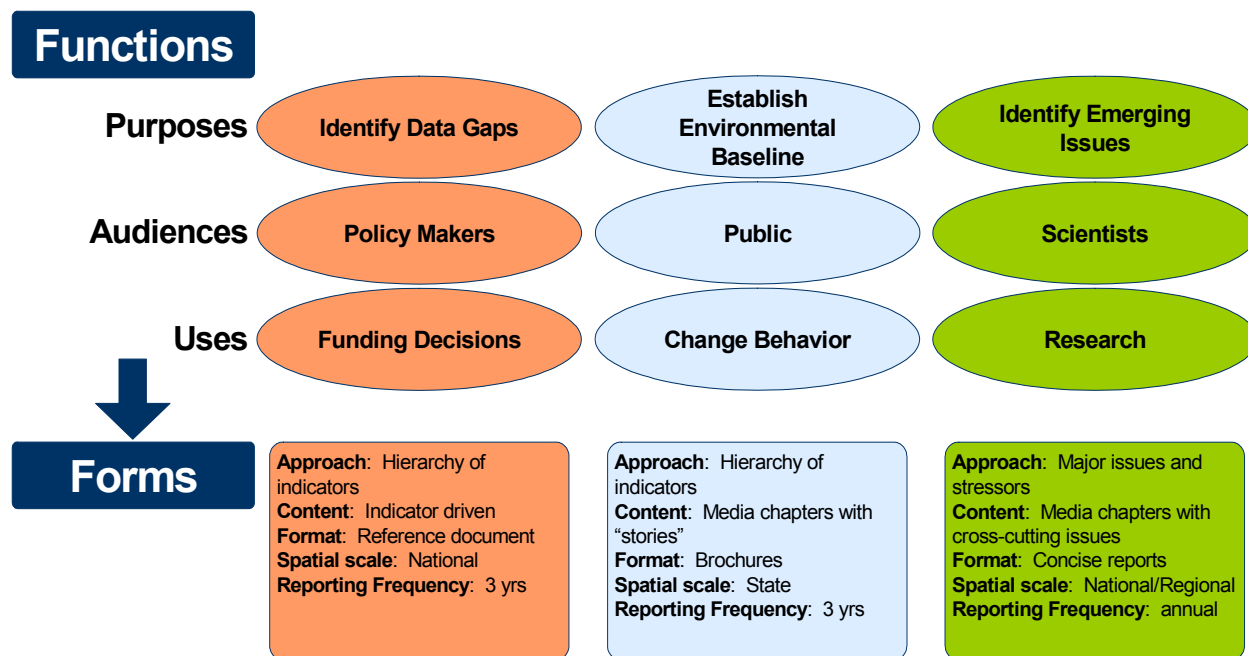


Exhibit 6: Possible Forms for the ROE Based on Various Functions

Structure/Approach to Indicators

Many suggestions were offered on potential approaches to, types, and numbers of indicators. The suggestions often conflict with each other, again, based on the perception of the function of the ROE. Many participants encouraged EPA to think about reducing the total number of indicators and to focus on a small number of critical indicators that are the most relevant for meeting the ROE's intended purpose, audience, and use. It was pointed out that some indicators may be closely correlated and duplicative, and could be eliminated. Other indicators do not adequately address the question and should be removed, even if there are no better measures. At the same time, many participants recommended adding specific indicators to cover their topics of interest.

Participants provided suggestions for focusing the indicators, such as relative risk (rather than absolute measures). For instance, "the health risks from exposure to air pollution are more severe for children, the elderly, and other susceptible populations than they are for healthy adults." Similarly, chronic exposure to air pollution has different effects than acute exposure. Other participants suggested that EPA "should make sure that its indicator framework is compatible with efforts and models, such as the Drivers-Pressures-State-Impact- Response (DPSIR) framework that many national indicator efforts are using."

There was an interest in ensuring the ability to talk about trends, but concerns about the comprehensiveness and context for trend data.

One participant noted: "Trend data are presented inconsistently. It is difficult to tell whether the environment is improving or not. It's not obvious whether ozone is good or bad, as there is no context presented in terms of how it affects the environment." Some suggestions emphasized that focus is needed to describe the goal of the indicators—both as a group of indicators (e.g., why is this set of indicators important?); and individually (e.g., what does this specific indicator say?). If this is not done, participants noted that the ROE runs the risk of having the indicators be the goal themselves, rather than the environmental condition or trend that they are trying to measure.

There were a number of comments about the Hierarchy of Indicators (page viii of the Public Report). Some participants thought it was a very useful structure that should have been more utilized as a framework throughout the report (e.g., indicators should have been identified based on their level in the hierarchy). Others were uncomfortable that administrative actions were directly connected to stressors and thought the hierarchy's limitations should be better explained. The type of information provided at each level in the hierarchy differs—ranging from "activities" to "outcomes." This means that the discussion of health or environmental conditions/effects will vary at different levels. One participant offered: "To be useful, the levels must reflect necessary and causal links in a chain of events leading from release, to exposure, to intake, to exceedance of a threshold dose that elicits a toxic response. Data collected at the first five levels do not necessarily imply an adverse effect at the sixth level." Some participants thought that an overall discussion of different indicator levels and their appropriate interpretation would be a useful educational addition. Others suggested that categories of indicators be included that go beyond the hierarchy to include other levels, such as the causes of environmental issues,

Indicator Ideas

"The ROE is missing discussion on the sustainability of culture. What in the environment sustains a culture? For instance, gaps include health issues associated with fish consumption (which vary among tribal populations). Another human health impact is recognizing that if tribes don't have native foods to consume, heart disease goes up. The ecological conditions that support (or don't support) the sustainability of culture include the effects from global/micro climate change. For instance, climate change may cause a winter period shortening, which affects stream peak flow that affects the survival of salmon, which in turn affects the sustainability of culture."

Seattle (R10) Participant

human influences on the environment, what is being done by EPA and others to address the issues (including preventative measures), and what it means in terms of the average person's daily life.

The ROE Technical Report introduces the descriptors "Category 1" and "Category 2" to define the quality and comprehensiveness of the individual indicators, but the discussion of categories is separate from the hierarchy presentation in the Public Report. EPA used the category designations as a way of describing the selection criteria for indicators, while the hierarchy is a way to organize indicators. Some participants, however, thought the hierarchy and categories should be linked, with additional information included on "completeness" of indicators (e.g., are all levels of indicators needed and present to respond to each question?). Overall, there was an interest in clarification of the indicator framework that EPA was using.

Several of the comments offered on structure and approach to indicators were based on perceptions of specific purposes for the ROE. Exhibit 7 provides an example of some of the comments based on the four functions discussed in the previous chapter.

Purpose: Establish Environmental Baseline	Purpose: Identify and Characterize Gaps	Purpose: Identify and Track Emerging Issues	Purpose: Evaluate EPA Performance
<ul style="list-style-type: none"> Focus on raw measures (versus those used as part of regulations) Use stable and comparable measures Do not use ROE to explain EPA budgets and activities Avoid indicators related specifically to EPA's mission and goals 	<ul style="list-style-type: none"> Focus on the "right" questions Do not just rely on existing data Acknowledge gaps in data and lack of knowledge Do not express "exactitude" in indicators if they are not based on the right data Focus overtly on the need for data to link environment and health, and identify gaps where data do not exist 	<ul style="list-style-type: none"> What is missing from the indicators is the effect of all unregulated, spontaneous activities. Is it enforcement or gaps in the law that cause negative environmental effects? EPA needs to look at the technologies and practices that are leading to environmental stressors. 	<ul style="list-style-type: none"> Narrow the scope of indicators to cover just EPA's responsibilities Relate each question and indicator to EPA's mission, planning, program activities, performance measures, etc. Include strategic goals and objectives for all EPA programs

Exhibit 7: Comments on "Indicator Approach" based on ROE Purpose

Content

There were hundreds of comments on specific gaps in indicators and content areas, as well as comments on what should not be in the ROE. The most frequently heard comments are summarized below. These are drawn from the meeting summaries, included as Appendices A-F and in the E-docket comments on the EPA website (http://cascade.epa.gov/RightSite/dk_public_home.htm). The following sections include comments on the overall organization of the ROE and specific suggestions on the air, water, land, human health, and ecological condition chapters. More detailed comments on the ROE chapters are summarized in Appendix G.

The following list represents suggestions for content areas that are missing or require more depth in the ROE. These suggestions surfaced in nearly every National Dialogue Session and on EPA’s E-Docket.

- Climate change (this was noted many times);
- Environmental justice (vulnerable, sensitive, and at-risk populations);
- Emerging issues (e.g., persistent organic pollutants, endocrine disruptors, genetically modified organisms);
- Energy use and sources—production and consumption;
- Invasive species;
- Coastal ecosystems, marine environment, and oceans;
- Water quantity and groundwater;
- Species/animal issues (e.g., Chronic Wasting Disease);
- Food (this does not belong in the land chapter);
- Land use, sprawl, and urbanization;
- Transboundary issues (in particular with Canada and Mexico); and
- Indoor air pollutants.

Participants noted that many of the topics included are not within EPA’s regulatory purview, but not all topics of broader interest to National Dialogue participants were covered. Using the title “Report on the Environment” implies that all environmental issues will be addressed. If that is not the case, and the ROE only covers EPA areas of responsibility, then the title should be reconsidered.

There was interest in including indicators on "human factors" such as population growth, density, and distribution; and the influences of resource consumption, technology, conservation, regulations, and the economy. Human factors might also include transportation-related topics, including vehicle miles traveled, commute distances, and use of alternative forms of transportation. Other human factors include per capita energy use, per capita water use, and recycling practices

Indicator Ideas

“The ROE should not include economic information.”

“This report should not be about whether EPA is doing well regulating activities. “

Seattle (R10) Participants

Participants noted that the ROE currently treats environmental indicators as distinct from economic and social indicators, when in fact they are inextricably linked. Several comments suggested bringing economic perspectives into the report, including specifics that directly affect the environment, such as timber and fish markets. Other comments offered that the ROE be organized around the concept of sustainability, recognizing that there are environmental and social limits to economic activity, and a need for equity within those limits. A suggestion was made to consider Daly’s Triangle (see Sonoma County, California’s website <http://www.sustainablesonoma.org/keyconcepts/dalystriangle.html>), which recognizes that the natural environment is a precondition for human life. The ROE could focus on the base of the triangle, the environmental “ultimate means” that support the “intermediate means” (economy, technology, politics, and ethics) that support the “ultimate ends” (equity and human well-being). Indicators of ultimate means could be devised that measure the stocks of ecosystem goods and services, and compare the rate of use to the rate of restoration of these goods and the throughput capacity of the services.

Content Organization

Participants offered diverse opinions on organizing the content of the ROE. Some thought that the human health and ecological condition chapters should come first, as humans are part of the environment and should be acknowledged. They held that if the goal is human and environmental health, the ROE should be framed accordingly and EPA should track these metrics and not the media (water, air, land). “EPA has a challenge to stop thinking within its traditional stovepipes.”

Other participants stated that the three media chapters make sense to the average reader, as this is how many agencies organize their programs and information. For some, the order of the chapters in the ROE represented an “evolutionary process.” A suggestion was made that having the ecological condition chapter directly follow the media chapters (before the human health chapter) would help the flow and connections among the chapters. Others suggested that the human health and ecological condition chapters should be eliminated until they can be “completed to the same extent as the air, water, and land chapters.”

Some participants expressed concern about the separation of common themes such as water, wetlands, and ecological condition, noting that these are linked and should be discussed more holistically. They noted that the concept of ecological condition is complex and interrelated with indicators discussed in other chapters. Some participants thought that there was not a lot of information in the Ecological Condition Chapter and suggested that an option would be to create stories about such things as the cumulative impacts that link water, ecological condition, and wetlands.

Another suggestion for organization, as well as scope, was to organize the ROE around the following questions: What has changed over time? What does the change mean, including what current the condition of the environment might be if investments had not been made? What will the condition of the environment be if no further investments are made?

Cleaner Air

There was a great deal of feedback on the lack of information on global climate change. Participants strongly stated that this represents a serious gap in the report and the enormity of the gap undermines the credibility of the entire report. Recognizing that there is disagreement on many issues related to global climate change and the contribution of greenhouse gas emissions toward climate change, participants none-the-less stated strongly that the possible consequences of such change still warrant attention in the ROE. Several participants suggested that indicators be based on sound, data-driven, objective measures (e.g., CO₂ levels, rate of glacial loss, runoff/snowmelt), rather than on measures based on value judgments or qualitative interpretations.

Indicator Ideas

“Issues could be linked. For example, air quality is related to travel time, which is also related to land use and modes of transportation. Bridges across issues would be useful—how do things relate?”

Philadelphia (R3) Participant

Indicator Ideas

“Outdoor air quality due to smoke (fires) should be included. This affects some parts of the country (e.g., the West, California) more than others. Smoke should be linked to chronic diseases, such as asthma.”

San Francisco(R9) Participant

Another identified gap area was indoor air. Even though two indicators were included, participants would like to see more because of the importance of the issue and its potential effects on human health, especially in children. Specific topic areas suggested include mold, cleaning compounds, viruses, and bacteria. There was also interest in identifying the data gaps that currently prevent assessment of these and other indicators on indoor air.

A few participants expressed concern about the Air Quality Index (AQI) indicator, saying that it could be misleading and that it does not “work” for sensitive populations, such as children. Other comments supported the use of the AQI as valuable in providing an indication of air pollution. Another identified air “gap” was air toxics. EPA should consider additional information or data sources in the final report, such as the National Air Toxics Assessment (NATA), which the Agency has spent significant amounts of time and money in developing. While NATA is still in its early stages and thus provides limited data, it also evaluates a broader set of air toxics.

Other participants expressed opinions that the air chapter is not balanced in its emphasis. Both acid rain and criteria air pollutants were mentioned as topics receiving a lot—if not too much—emphasis, while other important issues, such as tropospheric ozone, nitrogen deposition, bioaccumulatives (e.g., metals), mercury deposition, and ozone effects (e.g., on shrubs) were not adequately covered.

Purer Water

One of the most common gaps identified in the water chapter was information on wetlands. Several participants expressed concern about the way that the indicator was worded (“rates of annual wetland loss have decreased,” page iii of the Public Report), pointing out that it may hide the truth about wetland conversion and loss. For example, the rate of wetland conversion could be decreasing because there are fewer wetlands available to convert. Similarly, some comments focused on a need to provide longer-term data on wetland loss to highlight how few wetlands remain. There were also suggestions to include information about the size and quality (e.g., natural or human-made) of wetlands, status of priority wetlands, acres of wetlands lost, and extent or amount of unprotected wetlands.

Several participants would like to see more information on drinking water, such as information on consumption/demand, waterborne disease, percentage of population served by community water systems, Clean Water Act (CWA) related indicators (e.g., fishable, swimmable, drinkable), and measures of where adequate water treatment technologies are in place. If CWA information cannot be included, the section could be strengthened by including an explanation for the exclusion.

Indicator Ideas

“Many of the indicators are ‘lagging’ rather than ‘leading’ indicators. An example of a leading indicator would be an assessment of dollars being expended on wastewater treatment plants—this would give you some idea of what water quality might be like in 20 years. Or in the case of air quality, you could assess the future cost of health care due to poor air quality.”

Dallas (R6) Participant

There were several comments about the lack of information on oceans and many comments on the lack of groundwater data (quality, groundwater recharge, and consumption) and coastal issues, such as human-caused erosion. There was also interest in including more data about perennial streams (representing about 70 percent of watershed-based streams), and about imperiled streams and coral reefs. Finally, comments were offered about the need to address water quantity issues, including specifically water use patterns, measures of water use efficiency, and the impacts of water use patterns on other components (e.g., land, human health, and ecological condition) of the ROE.

Better Protected Land

Some participants found this chapter to be confusing, both in terms of how it relates to the rest of the report and how the sections within the chapter relate to each other. Participants observed that while the chapter included discussion about the possible implications of land use, chemicals, waste, and contaminated lands on human health and the environment, there were few indicators that actually described these interactions. Some comments indicated that this chapter was the most challenging because it is not specifically within EPA's purview. Participants thought that it was difficult to tell what EPA considered to be an environmental problem or how EPA would express environmental results. Additionally, indicators appeared to overlap with topics in the ecological condition (e.g., land cover/use) and water (e.g., wetlands) chapters.

Despite the confusion, many participants felt strongly that this chapter should be strengthened, particularly in the treatment of land use. Participants acknowledged the challenges of collecting good land cover/land use data (including data on forest types) and stated that this should be recognized at the beginning of the chapter. It is good to be up-front and realistic about the data that are not likely to be available. Participants suggested that population should be discussed and displayed as an indicator that would put many other issues into context, adding that population density should be displayed graphically. Population growth effects on ecosystems should also be included.

Participants suggested that fragmentation, extent of roadless areas, and rates of habitat conversions are also indicators that should be included in the land chapter. There should be a discussion about the wholesale change in forest types in some areas of the country due to management practices, and natural events and major disturbances.

One participant noted that information on land use alone does not define the condition of the land. It would help to also explore the impacts of particular land uses. For example, fishing may be safer in agricultural lands than urban lands. Other aspects of condition might be the amount of erosion coming from land use types, and wind and water erosion by region. These types of statistics would be more useful than discussion solely about the number of acres.

An observation was made that some of the conclusions about waste and contaminated lands that are presented in the Executive Summary of the Public Report should be better qualified based on the data presented in the land chapter. For example: "The nation is making progress in dealing with hazardous waste" is a statement that is based on very limited data (e.g., only data available nationally). More data available at the state and local level were not considered in these assessments and could change the "conclusions." Participants believed that not including state databases on waste generation and Resource Conservation and Recovery Act (RCRA) was a significant gap. One participant noted that, "The National Priorities List (NPL) site data are not a true indicator of the extent of contaminated land, because of the political and policy decisions that affect what

Indicator Ideas

"The economic (e.g., ecosystem services provided by wetlands) and social values of certain land cover classes and land uses should be discussed."

Chicago (R5) Participant

Indicator Ideas

"There is considerable evidence that changing land use patterns are having significant impacts on human health. Two examples are 1) Lyme disease, in which humans, ticks, and animal hosts come into greater contact because of suburbanization, etc.; and 2) more generally, vector borne diseases, in which disrupted environments may lead to greater vector homogeneity and concentration of virulence."

EPA E-Docket Comment

is included on the NPL” and that “The ROE under-reports the extent of contaminated land by relying only on EPA data.”

In general, the comments on the waste and contaminated lands section focused on wanting more information on topics, including recycling, waste management facilities (e.g., projected capacity), state- and locally-managed wastes, medical wastes, radioactive wastes (e.g., health risks associated with), and military bases.

Indicator Ideas

“A good indicator for the land chapter would be: the number of new housing units relative to new households.”

Philadelphia (R3) Participant

There were several comments about the use of Toxic Release Inventory (TRI) data, including data quality and reliability, and use of the word “releases” (because a substantial amount of these chemicals are properly managed and the term “release” implies to the public that there is no management). Other comments called for translating the data into terms that the average person can understand, rather than in tons of chemicals. At least a few participants expressed an interest in more pesticide data, particularly urban pesticide use.

Human Health

Although participants clearly appreciated the effort made to include this chapter and the information provided in the chapter—notably on children’s health—many comments focused on the lack of indicators that link the environment with human health. There was also concern that several of the indicators included in the chapter measured health conditions that may have no direct (or at least quantified) relationship to the environment, and that by including these indicators in the report, readers might be led to believe that there is a strong connection. At least a few participants expressed concern that the sidebar boxes listing indicators are particularly misleading in this regard. The suggestion was made that, if these health measures are going to be included, EPA should be very clear when there are and are not definitive linkages to the environment. Other comments expressed an interest in more discussion being included on linkages, both known and postulated, of environmental exposures and health outcomes (e.g., prevailing hypotheses on the role of the environment in autism, Parkinson’s disease, and Alzheimer’s disease). Several participants believe that additional information is available and should be included on the relationship between environmental health and human health, particularly for certain vulnerable populations, such as women of child-bearing age, children, and members of particular ethnic groups.

Indicator Ideas

“Include indicators that mirror environmental health priorities, such as 1) enteric diseases (e.g., salmonella, food borne illnesses); 2) blood lead; 3) chemicals in wells (e.g., toxins from dry cleaners, NPL, and gas stations); 4) small contaminated sites not on the NPL caused by leaking underground storage tank (LUST) and wastes; and 5) radon, mold, and indoor air as it relates to asthma.”

Atlanta (R4) Participant

One comment stated that: “The chapter falls short in discussing current environmental health concerns. Adding to the intricacies involved in translating an exposure to a dose and a subsequent health effect are many modern confounding factors—other coexisting chronic diseases, the contribution of work environments, the changing nature of work, the increase of women in the workforce as an environmental factor, etc. A second area of missed opportunity is a discussion of the complexity of racial and ethnic sub-populations. In general, many public information efforts are geared toward disaggregation of data to provide greater subgroup analysis and thus a more accurate picture of differential risk.”

Finally, an omission raised by some participants is the role of newer monitoring technologies, and physiologic or genetic technologies (toxico-genomics) in the development of measures that will actually protect human health. Mortality and morbidity data are, by definition, data from registries that are obtained after a health condition is manifested.

Ecological Condition

Participants recognized the challenges of trying to develop the ecological condition chapter. Data are incomplete and any data that are selected will only tell part of the story. Thus “the chapter fails to give more than a spotty picture of the condition of the ecosystems functioning in the United States.” This observation was not a criticism of EPA’s efforts, but rather an affirmation of the major point made in the chapter. Only a fraction of the data necessary to make this report possible has ever been collected.

Indicator Ideas

“There should be an indicator of how many fish ladders have been built and how many miles of river are available for fish.”

Philadelphia (R3) Participant

Several participants were interested in seeing more in this chapter or even an effort to organize the entire report around an ecosystem framework. Some participants offered suggestions for organizing frameworks, including “ecological footprint,” Daly’s Triangle, ecosystem functions, and ecosystem services. The Ecological Footprint Analysis, for example, calculates the resource consumption of human economic activities and presents the results through an intuitive metaphor, total bio-productive area required, or “ecological footprint.” Participants suggested that combining Ecological Footprint Analysis with life-cycle analysis techniques to determine the specific sources of resources consumed in economic activities could provide direction on where to focus ecosystem condition research.

Ecosystem biodiversity (and identification of biodiversity hotspots) and productivity were identified as critical indicators to be included. Additionally, participants suggested including data on how ecosystem functions have been affected by stressors. There were several requests for more information on invasive species and the problems they are causing (e.g., West Nile Virus, Eurasian milfoil, and zebra mussels). Also of interest was more information on habitat issues, the health of plants and wildlife, and much more on endangered species, including not only those listed under the Endangered Species Act, but also other species at risk. The Texas Environmental Resource Stewards Group, an agency consortium with federal and state participation, is looking at rarity and diversity (both of which have standard metrics) as good ecological indicators. Finally, there were several suggestions that more information should be provided on coastal and marine ecosystems.

Indicator Ideas

“Invasive species should be discussed in several chapters (e.g., land, water, and ecological condition), including the effect of these on various media, ecosystems, and industries (e.g., fishing).”

Chicago (R5) Participant

Format

Participants offered many suggestions on format for presentation of the information. Suggestions were made for different versions of the document (e.g., a simpler document for the public), as well as electronic access to the data. Some participants expressed frustration with EPA’s intentional separation of the ROE into two documents. Although participants understood that one was designed for easier reading and the other as a more technical reference, participants thought that omissions of important information and statistics in the Public Report detracted from its usefulness. Participants requested that additional copies of the technical document be made available in the future or that EPA consider combining the two documents into a larger report with a comprehensive executive summary and more detailed appendices. Some comments acknowledged that the Technical Report was easier to follow than the Public Report because of the systematic format. Participants requested more information on how to access the data sources.

Participants observed that the ROE should be made available on the web. By this, participants wanted more than a PDF file, including a database that could be searched and manipulated. As stated by one participant, “What today is a large stand-alone report capable of being published only every few years may eventually become a web network that is updated on a more frequent basis.” In addition to web availability, participants requested that the document be formatted in such a way that would allow “drill down” using hyperlinks to acquire additional detail on subject areas. Participants suggested that an HTML version of the document would provide this capability, while still leaving the overall structure at a summary level.

Exhibit 8 describes examples of comments on format based on varying perceptions of audiences for the ROE.

Audience: Public	Audience: Scientists (e.g., other federal, state agencies)
<ul style="list-style-type: none">• Simplify the document—decrease the number of indicators• Write in a tone that appeals to a broad audience• Include content that assesses well-known environmental issues and addresses concerns that affect personal well-being• Keep the document less than 20 pages• Write at a “lower” literacy level• Better distinguish between quantitative and qualitative data• Use a “National Geographic” format• Develop simple brochures for each chapter for different audiences• Provide a one-page scorecard that is updated annually (and rolled up every five years)• Include a “news you can use” or “what can I do” section• Synthesize the large report into stories or case studies• Don’t oversimplify (be careful of misleading with graphics)	<ul style="list-style-type: none">• Include a list of priority indicator gaps in the Executive Summary (this will help EPA and other agencies to work together to fill the gaps)• Create a table that identifies all of the current indicator efforts and opportunities for collaboration• Include a discussion about next steps in developing a robust set of indicators to build partnerships• Summarize the indicator framework so that readers can grasp the structure, including the pros and cons of each indicator and missing elements• Discuss options for consistent cross-agency monitoring and indicators

Exhibit 8: Comments on Possible Formats Based on Different Possible Audiences

Scale

The issue of optimal scale for indicators in the ROE was raised many times throughout the National Dialogue sessions, with typically widely varying opinions. The scale question arose in terms of geographic scale, with many opinions on whether the ROE should focus only nationally, or should include regional, state, or local indicators. Time scale questions were also raised, both as frequency of ROE production and the appropriate time frame for indicator measures. As previously noted, to a major extent, scale is also related to function—what’s the purpose of the ROE, who is the audience, and what will they use the ROE for? The following comments are organized under geographic and time categories.

Geographic Scale

The following quotes summarize the diverse perspectives on the appropriate geography for the ROE:

- “The ROE is at the appropriate scale—50,000 feet—and does a wonderful job at describing the environment at that level”;
- “The ROE is too ‘high’ (e.g., national) level”; and
- “The ROE should have a global context.”

Participants requested that EPA “not force all indicators to a national level, but focus on what is important or appropriate regionally and/or locally.” The emphasis in one session was on the ability for EPA to develop “indicators to work at a variety of scales. They should be able to drill down in both ecological and political scales.” Other participants expressed skepticism that EPA would have the resources to establish an “integrated core set of national, regional, and

local indicators.” Given this, it was suggested that EPA focus on the development of national scale indicators at this time. As an alternative to a national report, suggestions were made that “future reports could build on ten EPA regional reports developed in the same format. Regional reports would create opportunities to delve deeper on specific topics or in specific geographic areas, and provide more meaningful data for users.” This opinion was echoed by several participants, who requested additional reports that provide more detailed data at the regional level.

Indicator Ideas

“The ROE was intended to give a snapshot of the United States, yet it did not adequately address the very compelling pollution and environmental issues for the western states.”

EPA E-Docket Comment

Several participants noted that it would be helpful if any “human”(social/economic) information would be put in an international context, both to provide perspective and because the U.S. is interconnected with the economies, societies, and environment of the rest of the world. One participant remarked that while the ROE is clearly intended to be a report on the U.S. environment, the U.S. does not exist in isolation from the rest of the world. A number of environmental issues—notably greenhouse gases, stratospheric ozone, and deep ocean ecosystems—are global in nature. EPA should identify these issues, as well as their influence on the U.S. environment and the impact the U.S. has on these issues, and identify the challenges to effectively assessing and addressing them on the global stage. Similar sentiments were also suggested in comments that describe the ROE as helping to spread understanding about how the U.S. fits in the ecosystem of the world and considering the need for resource availability within the global community. EPA was encouraged to look at population growth and rates of resource consumption.

Many participants stated that regardless of scale, the ROE needs to be organized to allow comparison of indicators at all levels (e.g., state, national, global). As with statements on the use of the ROE, several

participants suggested that organizations should work toward convergence on the format and comparability of indicators. This included comments in favor of “collective decisions on the best way to collect and measure things.” Additional comments requested that EPA “come up with a good set of indicators that states can use that will provide local context at the same time they can be aggregated to national measures.” In addition, it was mentioned that it would be useful to see national level indicators that can be compared with indicators from other countries.

As discussed previously, some participants suggested that it would be extremely difficult to develop a “nested” set of indicators that can integrate the perspectives and environmental conditions that occur at different spatial scales. For example: “Appropriate goals and indicators for water resources can be very different between Western and Eastern states,” and “urban communities and rural communities would be expected to have very different environmental priorities.” Developing these indicators, legitimate at different scales, was considered too complex and unwieldy for EPA—or any federal agency—and therefore the focus should remain on developing a set of national indicators. A similar observation was that “data collected on water bodies does not necessarily lend itself to rolling up to national indicators. Using a different scale (e.g., regional or watershed) may be more appropriate to measure the state of the water bodies and to show improvements, which is the ultimate goal.”

Time Scale

There were several inter-related aspects of time discussed during the National Dialogue sessions. A common comment was that the time frames and trend data used in the ROE were not consistent. This was recognized as being due to the fact that the data that were used for the indicators were originally collected for other purposes and on a time schedule that met the needs of those purposes. The diverse range of data used in the ROE will likely make it extremely difficult, if not impossible, to have all data sets representing the same time frame.

Several comments also expressed an interest in a longer time frame or historical context for indicators. Some participants requested that EPA attempt to look at broader time frames for some indicators to provide context on how the indicator has changed over scales of 50 and 100 years. The dependency on various existing data, however, affects the availability of historical data. Several participants commented that the data seemed “old” and that more current data are available, although possibly not on a nationwide basis.

Indicator Ideas

“...the timeframes vary for each chapter and often do not extend back far enough. For example, the Air Chapter only looks at the past 20 years. The air is currently better than it was in 1980, but how is one to know if the air is better now than it was in 1970 or 1940?”

EPA E-Docket Comment

Many National Dialogue participants agreed that the ROE should be repeated on a regular basis, but suggestions for how frequently were diverse:

- “EPA should commit to a ROE on an annual basis and the current ROE is a good start.”
- “Producing the report every two years would be useful.”
- “A three-to-five year cycle for publication is good. If published more frequently, trends will be harder to see.”
- “Publish the ROE, perhaps correlated with new census data, every ten years for better demographic and socio-economic reporting.”

Other comments suggested that the frequency of the ROE should be aligned with planning cycles in federal, state, and local organizations, rather than to a specific time period. The comments did not

consider the frequency with which data are collected or monitoring is done, nor necessarily how often the indicators change or how quickly issues may arise that EPA should track.

Recommendations on ROE Form

All of the suggestions about form made during the National Dialogue sessions were based on varying perceptions of the function and audiences for the ROE. Thus, until EPA determines its purpose, there are few recommendations to be made on form. For example, if the goal is to reach and teach the public something about the environment and help them to better understand how their behavior affects it, a minimal set of indicators might be selected and presented in an easy-to-digest form, such as brochures. This might include ideas on how daily routines could be managed to minimize environmental impacts.

If the ROE is intended to create a scientific baseline that is used by scientists to focus research, a format that tracks a broad range of indicators on known and potential stressors might be more effective. This might specifically focus on assessing risks and would also require depth in documentation and references to site-specific information.

At a minimum, regardless of the function and form that EPA ultimately chooses, the Agency should consider providing open and full access to the data in the ROE as well as any additional background data used to develop the document(s). This can best be done by developing a web-interface to the ROE that includes URLs to original sources of data and full descriptions of metadata. Including a more detailed index and better cross-referencing of common themes can improve understanding and access, too. Other functionality of a web-based ROE process includes links to appropriate state-level efforts, as well as key word query abilities. A web-based document could address concerns, such as: “The ROE looks good and is easy for a lay person to read, but as a person who wants to extract information from it very quickly, it is not very useful. Readers should be able to turn to the list of indicators and immediately see the information on each indicator.” Additionally, if the ROE were published on-line, participants suggested that updates could be provided on the web between the publication of hard-copy reports.

Indicator Ideas

“Although very informative, the summary document is quite complex for a quick survey of the environment for the general public. A shorter, more ‘report card’ style may be more suitable. The document is, however, appropriate for the ‘informed audience’ that it was intended for.

The technical document seems easier to read and understand than the summary document. The format works very well to lead the reader through the indicator logic and the discussion of data limitations was valuable. The extensive use of graphs and tables makes the document easy to understand.”

EPA E-Docket Comment

Indicator Ideas

“The ROE could be published on-line and updated data provided between publication of hard-copy versions. If data can not be provided directly, providing users with a link to the data sources would be useful.”

Chicago(R5) Participant

IV. PROCESS FOR A “REPORT ON THE ENVIRONMENT”

Process (noun): a series of actions or operations conducing to an end. Merriam-Webster Online Dictionary (www.merriam-webster.com)

Many of the potential uses identified for the ROE assume ongoing publications and updates of the current draft. Related to this, many participants stated that EPA needs to commit to continuing to produce the report in the future. “An explicit long-term commitment is important to increase the usability of the report. It would make people more likely to depend on and use it.” Participants also noted that providing a timetable for production of the next report could have the effect of getting the environmental community to transcend the politics that ebb and flow with the change of administrations. EPA’s ability to establish a process for the next ROE will go a long way in building the partnerships necessary to sustain ROE production. Exhibit 9 depicts examples of steps needed as part of the process.

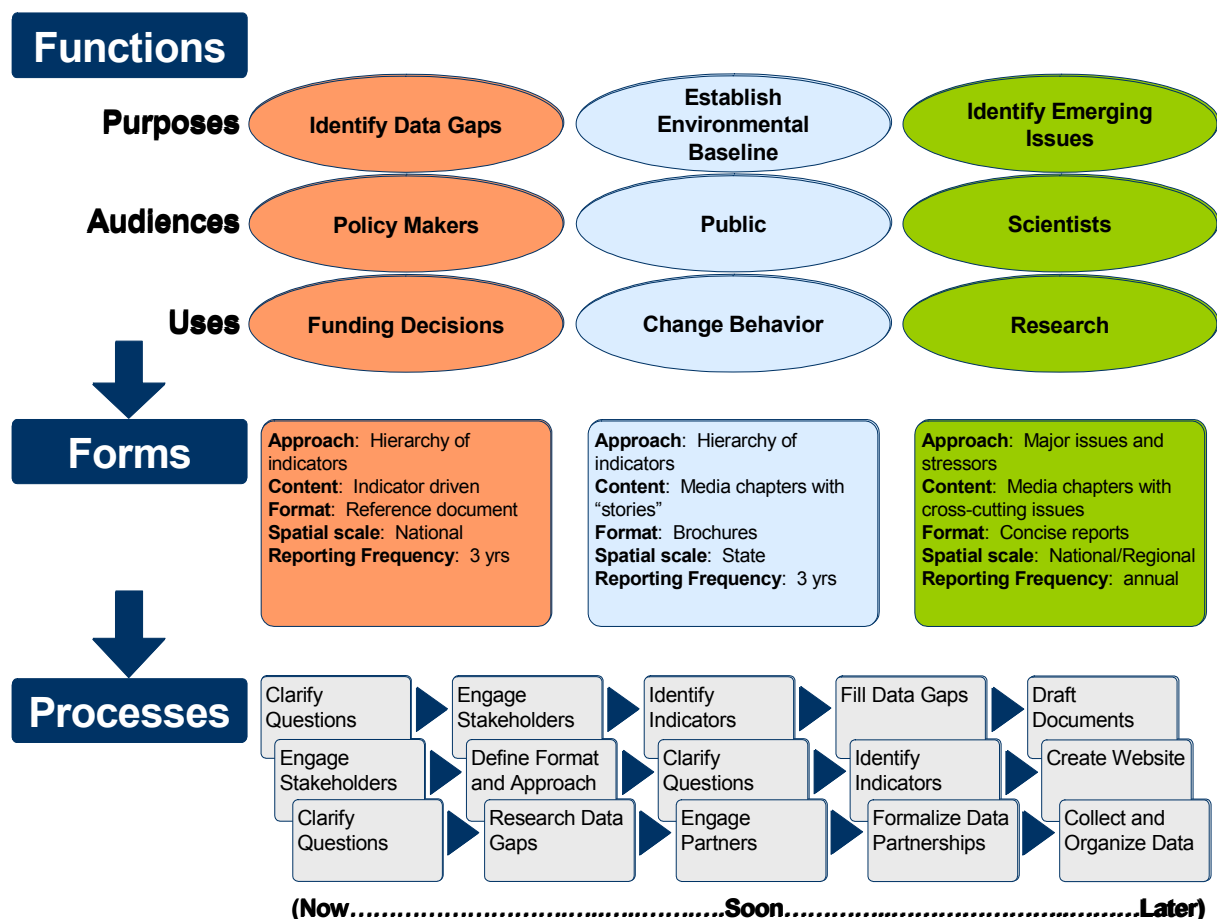


Exhibit 9: Examples of Possible Processes Based on Functions and Forms

Two topics mentioned many times during the National Dialogue sessions were the importance of ensuring the credibility of the ROE and common interests in indicators and partnerships for future ROE efforts. Examples of comments and suggestions for the next ROE effort are offered in the following sections.

Credibility and Objectivity

Participants commented that the usefulness of the document is dependent on the ability to trust that the data are objective and not influenced by political agendas. As already noted, the climate change omission undermined most participants' sense of the ROE's credibility and objectivity: "This deferral [lack of climate change data] overlooks a singular opportunity to report information on what is surely one of the most contentious of all current environmental issues," and "In keeping with the intent of the ROE to present environmental data independent of assessing the success of EPA's (or other agencies') programs and activities, the Agency certainly should include trend data on climate change indicators and greenhouse gas emissions in the ROE."

Other observations about the credibility and objectivity of the 2003 ROE include:

- "It is obvious that EPA is under political pressure, because it doesn't quite say what is and isn't going well. The executive summary is well written, but another synopsis to describe what is and is not working would be useful."
- "The positive tone goes too far. The majority of the graphs that show any decline have a footnote that says something like: 'this is due to increases in monitoring.' The unwillingness to say anything negative undermines the report."
- "The chapter titles (Purer Water, Cleaner Air, Better Protected Land) imply a "spin" and public relations, rather than science. Chapter titles should not state conclusions."
- "The report is not self aware of what has been left out and the limits of what these indicators may represent. If the indicators are to be used for management, there needs to be more discussion of what is left out."
- "Explanations should be given for why particular topics and also possible indicators (e.g., those that could be developed using National Water Quality Inventory data collected under section 305(b) of the Clean Water Act) were not included."
- "Many of the indicators are presented as absolute measures (e.g., air quality standards), when they are actually a judgement call. The "bar" changes over time, so the indices may report different things. It would be useful to describe the process that EPA uses to set these standards. It's important to make this clear when making comparisons and to identify the basis for the standards."
- "There is a concern that the Bush Administration is providing misleading information that is not consistent with the available scientific data and/or suppressing scientific information on important issues (e.g., climate change)."
- "EPA should show its biases up-front to provide context—what the Agency thinks is 'good' or the 'goal.' Making more clear the starting point, where things are now, and where things are headed would be useful. Talking about 'tons of TRI emissions' does not tell the public what they should be concerned about. EPA should describe what matters."
- "The ROE is a slick, press-oriented document, not a scientific document for decision makers. It fluctuates between arbitrary statements and incomplete statements. For example, relative numbers on recycling are provided without any reference to the absolute number—this could be intentionally or unintentionally misleading. Most decision makers would be happier with raw data in a tabular form."

Indicator Ideas

"The report's general tone seems to glaze over important issues and makes very general and biased statements in order to paint a very rosy picture of the state of the environment. The report seems to pull together statistics in order to support this picture, but the report downplays less favorable data as lacking or unreliable. This imbalanced handling of the data unfairly skews the conclusions of the report and reduces the credibility of the report itself."

EPA E-Docket Comment

- “Individuals in a position to use the ROE to make policy decisions must be assured the information in the ROE can be trusted. It is great that EPA put out a Report on the Environment, but policy makers need to know about the omissions. How did the EPA determine what stories to tell? Once the report user has the smallest bit of doubt, it leads to more doubt. The more the report can just be the data the more it can be useful, especially if users can get to the primary data.”
- “The report does a good job of capturing the pretty truths, but it is very conservative, does not want to ‘ruffle feathers.’ What is missing are the ugly truths. For instance, on the ground, at the local level, the air might not be getting better (at the national level it is).”

Remedies suggested to improve the “accountability” of the report included additional peer review, introductory statements clarifying the assumptions used and processes for developing the document, additional narrative on the purpose and use of the document as described above, and improving availability of primary data sources. Participants requested a clear “discussion of methodology and how the issues, questions, and indicators were selected.” Fully explaining why a particular indicator was used, and the indicator’s bias, was suggested to enable a reader to discern how suitably the indicators measure environmental quality. In addition, one participant suggested that: “It would be useful to see the raw values of concentration and the standard deviations of the concentration values.” Some National Dialogue participants who examined the Technical Document believed that it explained the indicators more clearly and thoroughly by providing information such as availability of supporting data, gaps and limitations, and indicator sources.

Indicator Ideas

“EPA fails to provide a complete and clear explanation of the methodology used to develop the report...”

- How were the key questions developed?
- How were the indicators picked to answer the key questions?
- How were the indicators judged to be scientifically sound?
- How was the information collected and synthesized from various federal, state, and local agencies?
- How did EPA validate the collected information?
- How were other agencies involved in drafting and editing the report?

EPA E-Docket Comment

Outreach and Partnerships

More than half the data in the current ROE came from sources outside of EPA. Much of the remainder of the data were derived from EPA Program Offices. These facts highlight the need for EPA to consider the role of and involve appropriate partners in future discussions about indicators. The engagement of external partners is essential to the generation, analysis, and maintenance of high quality data.

Several of the steps for development and release of the next ROE require the EPA offices responsible for the ROE (primarily ORD and OEI) to work closely with EPA Program and Regional offices, and with stakeholders and contributors outside of EPA. During the course of the National Dialogue sessions, it became obvious that many EPA Regional offices have developed productive working relationships with states on indicators. While the specific steps remain to be defined based on function(s) and form(s) for the ROE, many comments and suggestions were offered during the National Dialogue sessions. Additionally, within EPA, discussions about “aligning” the Agency’s Strategic Planning process and the indicators’ activities have been ongoing, and some of this information was presented during the National Dialogue sessions.

In the course of the National Dialogue sessions, various suggestions were made for next steps and partnerships in the ROE effort. One participant suggested that in an effort to make environmental indicators more “understandable and usable,” EPA should employ a variety of methods (e.g., surveys, focus groups, interviews with individual citizens) that would explore how best to “package” the ROE for the general public. Another participant suggested that additional National Dialogue sessions would be useful to talk about how to interpret the data. Another participant, supporting the view that more sessions such as the National Dialogue should be conducted, suggested the following as topics for such sessions. “What does ‘healthy biological condition’ mean? What is the ‘reference condition’ (e.g., pristine conditions)? Without a discussion on data interpretation, it’s not obvious there is agreement on where the nation needs to go.”

Participants noted that EPA should begin thinking about how to create good and sustainable federal/state partnerships on the ROE. States recognize and appreciate EPA’s effort, but state level contributions should not be overlooked. Participants suggested that the more consistent federal, state, and local environmental professionals can be in developing indicators, the more useful the ROE will be. This consistency will only take place with partnerships. EPA can leverage its funding role to encourage partnerships and dialogue.

Participants stated that the use of the ROE will improve if the states and EPA can establish a good set of indicators that will help guide the information collected by states (with resource assistance). Similar to EPA Regions, an assessment must be done to determine how well state-level indicators measure national interests and what is comparable or could be aggregated nationally. EPA must be clear on the framework, scope, and audience of the ROE to determine the indicators that are needed. States have an interest in indicators that support their functions. Collective decisions, based on an EPA-state partnership, could be the best way to collect and measure indicators of interest. Participants suggested that EPA should work with the states to try to identify the needs of states for indicators. The State of Texas made a specific offer to work with EPA on indicator pilot studies. (The City of Dallas also volunteered.)

National Dialogue participants suggested that the ROE should include—but distinguish—national activities from those that are supported at the state level (e.g., waste pesticide collection programs in 46 states that remove hazardous products from the environment). The states do a lot of work in the area of water quality monitoring and the omission of the 305(b) data was seen as “alarming.” Participants suggested that there should be a plan for making the state data usable for indicators.

Some participants made specific offers to work with EPA on various aspects of indicators. The American Chemistry Council supports EPA’s goal of “working closely with other federal agencies, tribes, states, local governments, non-governmental organizations, and the private sector to create a long-term strategy for developing an integrated system of local, regional, and national indicators.” The American Water Works Association is interested in working with EPA in the field of drinking water policy analysis and the development of data, information, and analytical tools to help better understand the effectiveness of the current drinking water program and the Safe Drinking Water Act (SDWA).

One comment suggested that EPA should participate in the efforts of the Interagency Working Group on Sustainable Development Indicators and/or a follow-on effort as suggested in the General Accounting Office’s May 2003 report, *Forum on Key National Indicators: Assessing the Nation’s Position and*

Indicator Ideas

“..the environmental implications of land use/siting decisions are increasingly being recognized at the state and local levels. EPA should strive to work with other federal, state and local agencies to develop an indicator(s) that assesses both the aggregate and media-specific environmental and economic impacts of land use decisions; in effect, an eco-economic indicator of quality land management.”

*National Advisory Council on Environmental
Technology and Policy (NACEPT)*

Progress. The EPA should design indicator reports according to the guidelines of the Global Reporting Initiative to ensure that U.S. reporting is compatible with world-wide indicators reporting.

Other federal agencies during the National Dialogue sessions expressed specific interests in working with EPA on indicators, including the U.S. Forest Service, U.S. Fish and Wildlife Service, the USDA Natural Resources Conservation Service, the National Park Service, the U.S. Geological Survey, and the Centers for Disease Control (CDC). In the case of CDC, there are specific opportunities under the CDC Environmental Public Health Tracking Network and the OEI Environmental Exchange Network to examine the potential to link environmental and health data in areas such as indoor air, asthma, lead, pesticide exposures, and environmental hazards.

Recommendations on ROE Process

As previously discussed, the clarification of function(s) and supporting form(s) will go a long way to help identify the process to engage appropriate players and produce needed outputs for the next ROE. As many participants noted, there is a critical need to establish and maintain a process that provides objective presentation of questions and indicators, and discussion about what is not included in the ROE. EPA must actively consider how to ensure that the process of selecting questions, indicators, and data is open, inclusive, and scientifically valid. Engaging partners, building consensus, fully documenting all decisions, and providing significant and meaningful opportunities for peer review will go a long way toward establishing credibility.

The interest in examining indicators at sub-national scales suggests an important role for EPA Regional offices. Many have developed regional reports on the environment and regional environmental indicators. Many Regional offices indicated a willingness to begin to evaluate available regional-scale data for the indicators included in the 2003 ROE to assess the relevancy and scalability of those indicators regionally, and to identify unique indicators that may be relevant in the Region. EPA Regional offices also bring deep knowledge of, and relationships with, state environmental agencies. OEI and ORD should consider how to take more advantage of this knowledge to establish state contacts and build bridges around common data needs.

Building partnerships with states is both an opportunity and challenge for subsequent ROE efforts. Many states have developed their own “ROE” and have significant knowledge about data sources and appropriate indicators, and are very interested in EPA’s effort. In particular, several states expressed an interest in having a framework of indicators that could be collected at the state level, and aggregated nationally, similar to some of the existing EPA national data systems. Several states, however, indicated a need for funding, particularly if EPA were to set “requirements” for populating an indicator framework. The indicator workgroup under the sponsorship of the Environmental Council of the States (ECOS) might consider a framework approach and offer recommendations. Other states already have indicator systems in place that meet their requirements and are not particularly concerned about a national perspective. For these, EPA might work through the Regional offices to establish areas of common interest.

Many of the data sets used in the ROE came from other federal agencies such as the U.S. Geological Survey, the CDC, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the Natural Resources Conservation Service. EPA must determine its interest in having other federal agencies as “partners” in the development of the ROE, and consider the responsibilities and incentives that accompany the partners. What decisions will EPA make with its partners? What are the incentives that would bring partners to the table?

How EPA establishes external partnerships, whether with states or other federal agencies, and the nature of the interactions (who is engaged, how frequently, and on what topics) will need to be decided. Exactly

how these partnerships are established depends to a large extent, again, on the function and form of the effort—what is being produced, for whom, with what content, and within what time frame? Trusting partnerships require time to develop and are most effectively built around commonly shared goals and mutual respect. Establishing the environment within which this can occur can be a significant challenge. A first step in EPA’s efforts to move this along might be the development of linkages (e.g., via a website) to existing indicator efforts and contacts. This could help to develop familiarity and a common language to foster communication and opportunities for collaboration.

V. SUMMARY OF NEXT STEPS

The National Dialogue has resulted in many comments on the ROE and suggestions for changes and improvements in products and process. The suggestions provide a great deal of “food for thought” for EPA as it takes steps in the evolution and development of the next ROE. The following bullets summarize recommendations for next steps that EPA should consider. EPA will need to clarify internally how it manages and “governs” the process of tackling these steps and developing the next ROE.

- Clarify the ROE function(s), including the purpose(s), audience(s), use(s) (this may involve audience needs assessments).
- Based on the purpose/audience/use, clarify the form of the ROE, including:
 - < Products to create;
 - < Indicator approach (e.g., trends, pressures, causes, questions);
 - < Number and topics of chapters;
 - < Content; and
 - < Spatial and temporal scales.
- Engage partners—both external and internal.
- Working with partners, review and revise questions as necessary.
- Identify indicators to use (e.g., indicators from ROE 2003 and new indicators).
- Identify and research indicator gaps (e.g., missing data, incomplete data).
- Establish a process to ensure credibility. Possible approaches include:
 - < Establish, communicate, and use a process that identifies how questions, indicators, and data are selected and used within the ROE. Involve stakeholders (e.g., data providers—internal and external to EPA) in this process;
 - < Ensure that “bad news” is not excluded simply because it’s bad. Explain decisions to not include data that would logically be expected to be included;
 - < Use language very carefully, avoiding perceptions of “spin.” Where doubts are raised, explicitly address the concerns in published documents;
 - < On contentious issues, present the best available science representing all perspectives and acknowledge the contentiousness;
 - < Establish and use a peer review process for selection and quality control of indicators and for document review before publication to ensure best available science; and
 - < Develop means to distribute “raw data” for analysis to ensure accountability (e.g., via the web).
- Explore opportunities for coordination and alignment with EPA Strategic Planning.

APPENDIX A
U.S. EPA's National Dialogue on the Draft Report on the Environment (ROE)
EPA Region 3
Philadelphia, Pennsylvania
February 12, 2004

MEETING OVERVIEW

Participants, representing a diverse cross-section of sectors and interests in the northeast, actively engaged with EPA representatives for several hours providing substantial and constructive comments on the 2003 Draft Report on the Environment. Several common themes emerged during this dialogue including:

- the value of the report in providing context for environmental issues
- lack of clarity on the audience for the document
- interest in including state comparisons of environmental conditions
- the importance of population size, growth, and distribution and associated land use and land development indicators in environmental quality and the need to include more of this demographic information in the ROE

MEETING SUMMARY

Welcome

Don S. Welsh, Regional Administrator EPA Region 3, welcomed participants to Philadelphia and the Region 3 office. Mr. Welsh addressed the data challenges of creating the Report on the Environment and characterized the initiative as an important first step. Mr. Welsh mentioned that specifically, from the Regional Administrator perspective, this document is valuable in understanding how best to apply EPA's resources to the environmental challenges of today.

Linda Travers, Deputy Assistant Administrator, EPA Office of Environmental Information, provided a welcome to participants from EPA. She emphasized that the National Dialogue is an important initiative for EPA.

Mike Flynn, EPA Office of Environmental Information, described the purpose of the National Dialogue as a means to solicit feedback from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public on additional information needs, gaps, and approaches to filling them. Additionally, EPA would like to receive feedback on uses of the ROE including alignment of indicators with planning and performance.

Mr. Flynn provided a brief overview of the ROE, indicating that the audience is primarily environmental decision-makers. Development of the document took more than \$1 million and eighteen months of effort. He described the "Hierarchy of Indicators" ranging from administrative to outcome measures and noted that most of the indicators in the ROE fall in the Level 3-5 range, including stressors, ambient conditions, and exposures. Most of the data are derived from EPA, other federal, state, regional, and tribal

information sources. Additional data are from The Nature Conservancy (NatureServ) and The H. John Heinz III Center for Science, Economics, and the Environment's "*State of the Nation's Ecosystems*" report. Next steps include summarizing these regional meetings; assessment of gaps; aligning planning and indicators; and developing better indicators that are integrated locally, regionally, and nationally.

Don Welsh provided additional background on EPA's choice to leave a discussion of climate change out of the report. The decision was based on an inability to achieve consensus on language within the publication time frame among all of the federal partners involved in reviewing the document. Mr. Welsh acknowledged that the climate change issue has been raised at all of the National Dialogue sessions.

In the following discussions, participants focused primarily on the "Public Report" and not the Technical Report. Some participants indicated that they were unable to open the Technical Report on the CD's that had been sent out. Participants' comments are summarized and presented as a series of bullets below.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)

Participants were asked to consider the following:

- Overall impression of the document
- Organization of the report

Overall Impressions

Academic Participants

- EPA should provide a schedule for the rollout of the next document. Will this document be finalized?

[Mike Flynn replied that EPA does not intend to finalize the report, but rather to use input from the National Dialogue sessions to refine the next version and to assist with determining appropriate timing and format of subsequent releases of the document.]
- The report should have a description on the state of indicator use in environmental protection.
- The report should utilize simple indices, maybe with color coding to depict issues. It should also provide an indication of how the U.S. contributes to global environmental problems.
- The report should look into the role of population size, population dynamics, and effects displayed *per capita*. It is important to tackle the issue of population size and growth and the effect that this has on the environment. It would be helpful to see patterns associated with population distribution, technology, and agriculture.
- The report is very readable and has nice graphics. It is good to have a report like this available to put environmental issues in context. The media (newspaper, television) just provides splashes and sound bites on issue such as lead in houses, mercury in fish, and spotted owls. It's important to help the public see the "big picture."
- Although the report presents what we don't know, it does not give an indication of the relative importance of the different gaps in knowledge.
- Can EPA put out a report such as this without being seen as biased? There is a credibility issue. The report also seems to perpetuate EPA silos rather than looking at issues more integratively. If

the report cannot be isolated from political agendas that effect the interpretation or display of results, EPA should not be the author of the report.

- The report should say upfront that EPA does not regulate all of the environmental issues discussed.
- The executive summary should address EPA's values. This does not have to be a neutral report. EPA should address how it will use the report to manage effectively.
- This report is not a scientific report - statement of facts. It is a policy report. If the goal is to change behavior, then the information will need to be better digested - which means getting into values. EPA needs to decide if this is what they want to do.

Federal Government Participants (Non-EPA)

- It is good that this report takes a comprehensive look at the environment, but the report should have a discussion on how changing standards effect trends analysis (e.g., difficult to describe trends in air quality standards over a period when standards have changed).
- There should be a caveat in the report that states that the trends in this report are the results of previous environmental policy and that this should not be construed as a statement of what is going to happen in the future.
- There may be little that government can do to collect data, but we can encourage the use of standardized systems of indicators.
- The audience needs to be clarified.
- What niche does this fit into in regard to other national environmental reports?
- The report should stay a *State of the Environment* report but there should be a companion document that reports what is being done about the issues presented in the ROE.

Private Sector Participants

- The report is very well put together. This report hits the mark. The best part was the context it provides. Several private companies are also working on performance measures. There is an opportunity for collaboration and developing "metrics that matter".

Local Participants

- The audience for the report is not obvious. This made it difficult to understand what the reader was supposed to do with the information. This issue should be the first issue addressed during the dialogue sessions.
- The report is impressive in both its form and substance. The scope and the breath are appropriate for a national report as well as the focus on measurement and accountability. The questions approach and the case studies were helpful.
- It is very positive that the report had a section on environmental health. There should be a strong message that many of the indicators in this section are those that people have a lot of control over in their own lives.

- The report needs a better explanation of how it will be used as a baseline. In addition, there should be additional local examples.
- The report is very readable, with good graphics and layout. It would be valuable to have state comparisons, with good local examples.
- There should be an expansion of the next steps section that includes a better description of data gaps and specific roles of the program offices in addressing data and measuring progress. There should be a big role for the EPA regions in the next steps of the report.
- More involvement from grass roots organization is needed.
- EPA is to be applauded for this effort. The writing and graphics are good. More needs to be said about the fact that things are better now than they were, but also that we are smarter. Where does it explain the improved ability to detect toxics and track pollutants? The effect of these improvements should be separated out in the trends discussion.
- The report needs to reflect that it's "us" (people, population growth, and human development) that are affecting the environment, not just smoke stacks.
- Indicators must work at a variety of scales. They should be able to drill down to both ecological and political scales.
- EPA should not change the subject of the report every few years (as the Council on Environmental Quality has done). This makes it difficult to compare across years.
- This is a great start. The public is aware that environmental progress has been made in some areas (air quality, water quality) but issues of land use and land use development are not as well understood.
- The report presents lots of information about very well financed initiatives, such as the Chesapeake Bay, but what about other areas that are not as well supported.
- Drilling down to local data should be done with caution as these often create "media splashes".

Not-for-Profit Participants

- It is amazing that EPA could put out such a report in such a short time frame.
- Who is the audience? The report works as an EPA baseline and perhaps for environmental professionals, but it is not for the "person on the bus."
- How does this report fit with other National efforts (e.g., Heinz, National Report on the Sustainability of Forests, etc.) There is a danger if there are independent efforts - will create an argument about who has the "right" data.
- The questions that the report was based on seem to be out of context. The report does not provide EPA's policy as a background. This would provide a framework for the document and assist with understanding the document and determining if these indicators represent the right indicators. A framework would tell you, this is the goal and these are the measures that will tell us how we are doing toward that goal.
- This is a very helpful document. The tone and the emphasis on how far we have come are good. It would be helpful if the document allowed state comparisons.
- How much does this report relate to ReVA (EPA's Regional Vulnerability Assessment)? The

report should have some trend analysis, especially if the report could be broken down regionally. It is interesting to have the broad overview, but it would be useful to know “where” environmental issues are of concern.

[Jay Messer responded: ReVA data are only available for a specific geographic area. In the ROE Technical Report there are two categories of indicators, with Category 1 indicators being differentiated as having data available nationally and for more than one time period. Both Category 1 and 2 were peer reviewed. There was a desire to focus as much as possible on Category 1 indicators in the document, so there was less emphasis on data and indicators that were only available regionally.]

- It would be useful to have a scoresheet upfront of where things are going.
- There are no confidence intervals presented. It would be nice to know the error associated with the data. There should be a statement at the beginning of the document that describes the data in the report as “broad generalizations”.
- The report seems to have indicators that are picked more for the sake of convenience than for the quality of the indicator. For example, how do you winnow down all of the possible ecological condition indicators to just a few? Or do you summarize all of them broadly?
- Some other segment of society (credible and independent) should issue this report. As an alternative, there could be a sister document that is independently released and provides an assessment of the current policy and efforts.
- The report does not present the innovative things that states or counties are doing to address environmental issues.
- The report should frame environmental issues by providing some estimate of the capacity of an ecosystem to accommodate change. This would improve understanding of the effects a given change might have on a whole ecosystem. Some changes might be very detrimental if an ecosystem is close to its capacity. The State of the World Report (www.worldwatch.org) does a nice job of framing environmental issues and could be a good example for future a ROE.

State Government Participants

- The human health and environment chapter were well written. Pennsylvania is about to release its first set of sustainability indicators. That process began by looking at all of the State’s environmental indicators.
- When requesting additional data and developing strategies to gather data to fill data gaps, EPA should consider the burden that puts on States.
- The report doesn't provide enough closure. It doesn't talk about innovative approaches on how to fix the issues presented. The overall thrust of the report didn't complete the effort. It should be able to answer questions such as: How many wetlands can we afford to lose? Why does the quality of drinking water not meet standards for 6 percent of the population?

B. Report Organization

Academic Participants

- Would like to see a consistency of indicators, at least within the same watershed.
- There should be a separate section on land /ecosystems and a section on toxics and waste. The first could focus on forests, wetlands, endangered species, etc, and the latter on TRI . The food chain should be included.
- Chapter 5 (Ecological Condition) was a drastic change in format. It was hard to shift gears.
- Appendix A was useful to link indicators to specific questions.

Local Participants

- The data should be collected by ecoregion. This would allow states to collaboratively collect data and map trends.

Not-for-Profit Participants

- This is a “technical” public document. The next version should include a two-page summary that is written on a similar literacy level as a newspaper. This would work for the “person on the bus.”
- The report should have a regional case study. An example of an interstate cooperative effort among organizations would be compelling.
- The report could benefit from being organized from a stakeholder perspective.

State Participants

- The report should be organized so that it is easily usable by decision makers called upon to respond to a request or question.
- Groundwater issues are not presented in a single area. In order to get a full picture you must jump around in several chapters.
- For this to be an effective public report it should just be a few pages, perhaps with a few key sections from the executive summary.
- There are many issues about scale - some indicators should be presented based on ecosystems or watersheds, other jurisdictionally. Both are important and work for different issues. At the state scale, it should be possible to drill down to get to the data that states have. Other problems should allow drill downs ecologically.
- This report did what it was intended to do, to show “state” not “cause and response”. This is a good place to start, but the public needs to understand the thinking about the causes. EPA needs to address the process of engaging the public in thinking about what causes certain trends. The benefit of the ROE will be lost if some strategic thinking about the causes of the trends is not included. And this should not just be a budget discussion.

Discussion 2: ROE Issues and Questions

Participants were asked to address the following questions.

- A. Are the right "issues" identified? If not, what should they be?
- B. Are the questions appropriate for the issues? If not – what should they be?

Not-for-Profit Participants

- The lack of a clear audience makes it difficult to determine if the “issues” were correct.
- The questions are good, but there could be more integration.
- The land use questions are problematic. They are presented in a way that is different from the other indicators. It takes too long to get to the “so what.” The questions in the document ask, “what is the extent of developed land”, but this does not get to the issue of loss of natural resources or agricultural lands due to development practices.
- There needs to be a discussion about the fact that the country is urbanizing faster than population is growing. Trend data are really important.
- There is a whole indicator set on land use and environmental quality that is missing. The rate of land protection should be included. “How much land is being saved?” should be asked.

Federal Government Participants

- The fact that the report does not address greenhouse gas issues shows that there are policy problems. This creates credibility issues.
- Issues could be linked. For example, air quality is related to travel time, which is also related to land use and modes of transportation. Bridges across issues would be useful - how do things relate?

Local Participants

- For every dollar we spend in redevelopment, developers spend 10 to 100 developing property. A good indicator would be how much land is being redeveloped vs. green lands being developed.

State Participants

- There needs to be discussion about why some of the issues are important. Why do we care about grasslands? Because we need to know if we have enough to support what is needed (e.g., the species that are dependent on grasslands). The issues should be expressed more in terms of sustainability.

Discussion 3: Report Indicators and Gaps

Participants addressed the following questions:

- A. What other indicators/data would be useful? (e.g., regional, state, local?)
- B. How should they be "integrated" with National indicators?

General Indicators and Gaps

- The concept of relative risk is missing from the report. There is no indication of what the most important indicators are. "What are the top 3 things I should be worried about?"
- Is there a goal for indicator improvement? There are issues when EPA puts out a standard and asks states to collect data to meet it, especially when resources are not available. If EPA doesn't do this, however, there will never be consistent measures.
- Some indicators should be collected and organized by ecoregion.

Air Chapter Indicators and Gaps

- There is not enough information on air toxics or on emerging pollutants.
- Greenhouse gas is important.
- The National Academy of Sciences is dealing with greenhouse gas issues - could the ROE report this research?
- The National Highway Cooperative Research Program (NHCPR) has put out a report call Travel Matters (see www.travelmatters.org) which allows calculation of individual contributions to emissions. This is useful to help individuals understand their effects on air quality.
- There should be consistency in the axes used on the scales of the graphics.

Water Chapter Indicators and Gaps

- There should be more detail on water use and water availability. This issue is now becoming important in the Eastern United States as well as the West. Per capita consumption should be tracked.
- More information on supply and demand would be useful. They are related. Quality may be good, but there is not enough water.
- The report does not explain how improvements in detection limits for water quality sampling equipment causes some pollutants to be reported that were not previously shown (i.e., not due to increased pollution). The ROE is an opportunity to explain this in detail.
- The ROE should include information on oceans.
- Fish consumption advisories are controversial and a difficult measure to compare because data are collected differently in each state.
- EPA should establish a "leading" indicator for source water contamination.

- An indicator to consider for the water section is the amount of impervious cover *per capita* in suburbs vs urban areas.
- EPA should look to regional and state efforts using maps to estimate impervious cover and aggregate this information nationally.
- A goal should be set for sustainable use of water and it should be “pitched” to the public.

Land Chapter Indicators and Gaps

- It may be ok that the land indicators are presented differently. The report should present why the land indicators are important. It would help this section as it is a “newer” environmental issue - and may need to play out for 20-25 years. More detail on trends and what could happen if current trends continue would be useful.
- Land use is important, but it should not be a measure of EPA’s performance or of State DEPs - because these agencies have no tools to affect land use. The work horse statutes (e.g., Clean Water Act, Clean Air Act) drive most of the progress represented in the report, through all of the changes in administrations. People that work on these programs account for much of this progress.
- You can’t ignore land use simply because EPA does not have power to regulate it.
- Land use impacts should be presented in context of other issues (e.g., sprawl). EPA needs to look at ways to collect indicators together to frame issues.
- The indicator on grasslands should present how much we are saving through environmental management efforts.
- The ROE should emphasize that EPA does not have jurisdiction or tools to affect land even though land use is an important issue
- EPA’s work on “smart growth” has been important and shows that EPA is involved in land issues. Indicators might be developed to address whether “smart growth” is working.
- The ROE needs some type of *per capita* index of land consumption, perhaps a ratio related to population.
- A global pitch is important, including what impact people do have on species. An indicator could be the aid that the US gives to other countries for environmental protection.
- The land chapter should include more than just EPA waste sites, the states have more data.
- A good indicator for the land chapter would be: the number of new housing units relative to new households.
- The impervious surface sidebar is good, but a better reference than a conference proceedings is needed. New science is indicating that even less impervious surface than previously thought can cause watershed degradation. More comparisons of acres of impervious surfaces per area of development, or dollars spent on development versus open space preservation, or rates of urban development versus green field preservation would be useful.
- An indicator might be amount of impervious surface per capita in suburbs versus in urban areas.
- Make more connections. If streams lose fish and/or water quality declines, then property values decline.

- Land use should be connected with water use and ecological condition.

Ecosystem Chapter Indicators and Gaps

- Exhibit 5-10 in Chapter 5 is a good graphic that shows linkages. More such as this would be useful.
- Exhibit 5-10 should go beyond fish to show effects on humans.
- The ROE should address loss of fish species.
- The ROE should give more than just bird examples, perhaps insects, aquatic species, etc.
- There should be an indicator of how many fish ladders have been built and how many miles of river are available for fish. There may be needs to recolonize some areas.
- It would add understandability if the report presented keystone species or indicator species, especially those that would resonate with the general public such as bald eagles.
- There should be an explanation of how some times ecological indicators don't always agree.
- Additional descriptions of indicator methodology is needed to ensure that people understand how to interpret ecological indicators.
- Landscape conditions should be described, not just extent of landscapes. This should go beyond benthic community index, other invasive species (e.g., cheat grass, zebra mussels), and tree condition.
- Ecological health is most challenging. There are some global efforts (UN Millennium Assessment) that start with Landsat data. EPA could recommend how the nation should build a better data system for doing these types of assessments. It needs to be more than just scientists making these recommendations.
- More examples of invasive species would be useful, including a chart that shows insects, aquatic, and plants and the issues in terms of public health and disease and habitats.
- Identify keystone species that the public really cares about and discuss their condition and whether things are getting better.
- Different ecological indicators - chemical, biological, physical, etc - may have different responses - so do not always agree with each other. This must be explained to the public.
- A new indicator might be something about condition of aquatic life (e.g., fish lesions, deformed frogs). But the public would need to understand the causes of these conditions.
- Function is important - are the wetlands functioning, not just how many acres exist.

Discussion 4: Use of the Document

Alex Wolfe from the EPA Office of the Chief Financial Officer described how the indicators will serve as an important tool in priority setting in the next EPA Strategic Planning cycle (which will begin in 2004 for the 2006 Strategic Plan). For management purposes, it would be beneficial to use the indicators to identify where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past, but this will require establishing a good baseline. Annual planning requires setting annual targets—even a subset

of high quality indicators would be a signal of willingness to commit to a set of measures as part of the annual plan and budget.

Participants were asked to consider the following questions:

- How have participants used the report?
- How might participants use it in the future?

General Comments on Use

Academic Participants

- This report should be used to generate dialogue, especially inter-agency, federal, state, and local.
- EPA and state partners may be the ones that use the report the most. This report could also be used as a basis to develop a suite of environmental educational materials (e.g., curriculum).
- It is very important that everyone has an expectation of when the report is coming out and on what cycle.
- This report can be valuable for use by the Cooperative Extension Service. It can be used to help in pesticide application training and safety programs and address land use issues. County agents could use this to indicate “we’ve come a long way.”

Federal Government Participants

- EPA should use the report as the basis for a national dialogue, outside of EPA, on data and legal gaps in national environmental policy and protection. For example, the land use issue could be used to begin to talk about how to most effectively measure land use. Years ago HUD got involved with the US Dept of Transportation to address land use relative to highways and it changed the way US DOT did its business. The opportunity for dialogue is very valuable.
- The greatest value of this report is not in the individual measures but in how they explain and show connections. It has tremendous value in terms of the narrative story about relationships.

Local Participants

- As local governments we do a lot of work with Census agency data. We decide on our own, from the neutrally presented data, causes and solutions. This neutrality is what we like about the current ROE. If the ROE becomes a national policy document, with data, causes, and solutions then it will not be as helpful. If the ROE analyzed causes and effects of issues such as land use nationally, and then pre-determined solutions - local governments would not find this useful. There are many ways to address the issues, and local options need to exist.
- At the local level this will be helpful if policy makers can relate how local conditions compare to national conditions. This provides a chance to educate the policy maker and the public on how local conditions fit into a national context. This does imply some burden as new indicators mean new ways to measure. In addition, parts of the document may be taken to demonstrate local area data for educational purposes. Involving kids in the community may be one way to expand understanding and build data bases.

Not-for-Profit Participants

- This will be very valuable to help develop environmental education courses. Production as a video/DVD might be useful.
- If the report is presented on the web, it should be broken apart with the appropriate section found with the corresponding media (e.g., the water section should be with EPA's water program web sites).
- Could EPA sponsor a grant program to let local communities determine what is the best way to communicate the ROE messages?
- Examples such as Tom Ridge's efforts with land use in Pennsylvania show that reports such as the ROE can drive change at the state level.
- There are National Roundtable Discussions being conducted on forests, wetlands, range, minerals and energy, and water that are discussing indicators. EPA should consider how to get more involved in these and use them as an opportunity for cooperation.

State Government Participants

- The next step we are taking at the State level is to bring strategic plans into individual performance plans. Community outreach was an area where we found we needed to do a lot more. States and EPA need to work in concert on these types of efforts.
- This report is good for college level courses but the approach should also be broadened to include kindergarten through high school. The approach might be similar to existing programs like "Project Wet" and "Project Wild."
- State agencies would like to be able to compare state data to national data. This is difficult to do with this report because there is no specific program data. Local politicians will ask where they rank relative to other communities.
- The report does not tell the public enough about whether things are getting better or worse.
- EPA should lead to establish a set of national indicators that can work at a variety of scales. If EPA will decide what the right few indicators are, most states will follow the lead.
- There are many different federal agencies issuing state of the environment reports. How are things being coordinated at the federal level to develop an integrated federal state of the environment report?
- The report should describe the state and federal plans, programs, and funding available to fix the problems identified in the report.
- This report could possibly be a candidate for a show like PBS's NOVA. This would be a good opportunity to dig into the many issues of the Report on the Environment.
- There are 35 states currently doing ROEs - roughly 20 out of 40 indicators in these efforts are common and "nestable." EPA should consider how to take advantage of these - to integrate regionally or ecologically depending on the issue.
- This should be kept as a ROE - not a description of what to do about it. Pointers can be provided to other websites when this is web-enabled. Tying too close to strategic planning could make it

“fluffier. “ There are many complexities - keep it science-based and produce another report for solutions.

- This should be displayed and linked on many EPA web pages, not just under “indicators.” There should be fact sheets produced on it for each program.
- Thought should be given to communicating with the private sector and with children to change their perceptions over time.
- States should be brought into the planning process for the next report. This should be done through the regional offices because they have already established relationships with the states.

Discussion 5: Value of the National Dialogue

- This was a good process. Next time perhaps smaller groups and more breakout sessions.
- Good process.

Public Comments

No public comments were offered.

Participants

David Hart, Academy of Natural Sciences in Philadelphia
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Joe Matassino, Partnership for the Delaware Estuary
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Janet Milkman, 10,000 Friends of Pennsylvania
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Claire Billett, Natural Lands Trust
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APPENDIX B
U.S. EPA's National Dialogue on the Report on the Environment (ROE)
EPA Region 4
Atlanta, Georgia
November 13, 2003

MEETING OVERVIEW

Participants, representing a diverse cross-section of sectors and interests in the southeast, actively engaged with EPA representatives for several hours, providing substantial and constructive comments on the 2003 Draft Report on the Environment. Several common themes emerged during this dialogue including:

- the need to clarify the purpose and intended audience(s) for the document(s);
- consideration of appropriate sequencing of indicators and goals. (should goals be defined and indicators developed to track progress toward the goals, and/or are indicators based on critical questions/science and then used to help identify goals?);
- the need to assess the inclusion of some indicators, in particular human health conditions not specifically correlated with environmental factors; and
- more use of an ecological framework approach for developing and reporting indicators.

MEETING SUMMARY

Welcome

Cory Berish (Chief, Planning and Analysis Branch, Office of Policy and Management, EPA Region 4) welcomed participants to Region 4. Kim Nelson, Assistant Administrator, EPA Office of Environmental Information, provided an overview of the Report on the Environment, including key findings. She described the purpose of the National Dialog as a means to solicit feedback from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public on additional information needs, gaps and approaches to filling them, and uses for the ROE, including alignment of indicators with planning and performance. Comments from this dialogue and others around the country will help to inform the process and development of the next ROE.

Questions

Kim Nelson responded to the following questions:

How will EPA ensure adequate involvement from other federal agencies on the next draft of the report?

- The goal of the document is not to cover everything that government does related to the environment, but to focus on EPA's responsibilities. EPA recognizes the need to interact with other federal agencies, but because of the tight time frame of the project, this is a challenge. EPA would appreciate suggestions on how to most effectively link and coordinate with other federal agencies.

What data sources are used in the report?

- Most of the data are derived from EPA, other federal, state, regional, and tribal information sources. Additional data are from The Nature Conservancy (NatureServ) and the John Heinz III Center for Science, Economics, and the Environment's "*State of the Nation's Ecosystems*" report.

Do the aggregate statements (e.g., “Since 1970, total national emissions of the six most common air pollutants have been reduced by 25 percent”) represent averages or means?

- Individual indicators vary in how they are calculated. In the case of air, this was calculated as an average. Stream and water quality data are examples of indicators where aggregation was not possible.

Can EPA report on where we should be after 30 years of environmental laws versus where we are now?

- That is difficult to do, as what “should” or “could” be done tends to be a personal interpretation. The report does not specifically report the results of EPA activities. EPA publishes an annual report that documents accomplishments. The Report on the Environment is exactly that, a report on the current condition of the environment. This is similar to the way that the Bureau of Labor Statistics distributes data on unemployment. Discussions about what causes economic conditions is independent of the reporting of the numbers.

Would EPA consider making statements about or setting goals for the future (e.g., acid rain will decrease)?

- The report is not a strategic plan or goal-setting document for EPA. Part of the National Dialogue, however, is about EPA’s efforts to align the ROE with the Agency’s strategic planning activities.

There seems to be an emphasis on data gaps. How might these be addressed by EPA Regional knowledge?

- One of the data gaps that we acknowledge and has been pointed out by the press is climate change. This was a topic on which we could not gain agreement in time for the publication schedule so the decision was made to leave it out of this draft. If we had more time it would have been in there. This is not something that would have changed based on local knowledge. We are very interested in how to integrate regional (and even local) indicators will as part of the next report, so any suggestions you have to help us do that would be appreciated.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)¹

Participants were asked to consider the following:

- A. Overall impression of the document
- B. The value of having two documents - a “public report” and technical document
- C. The usefulness of the media and outcome chapters, including the order
- D. What EPA could do differently to improve understanding
- E. The frequency and format for publishing the ROE

A. Overall Impressions

- The report is well written with outstanding graphics. It reads and is presented like a text book that might be appropriate at the upper high school or lower college level.
- This is a good tool to use with a group of students interested in subjects such as eco-toxicology.
- “I gave the document to my husband who knows nothing about the topic and he enjoyed it - especially the graphics.”
- “I didn’t fall asleep reading it, which I often do with this type of document.”

¹ Participants focused their comments primarily on the “Public Report” and not the Technical Document. Many were not aware that there were two documents.

- The report looks good. It has plenty of visuals (e.g., maps) with a proper balance between graphics and text. It is user friendly. In particular, the hierarchy of indicators presented in Exhibit 1.1 is useful.
- The report is excellent. It is a great summary of 30 years of work.
- It is interesting that a large amount of the data for the report came from outside EPA while other EPA data were not used (e.g., the 305b data were not used). There could be even more outside data used.
- The “purpose” of the report is weak and intended audience is unclear. (Under “Message from the Administrator” could change “...help answer America’s questions about the environment...” to “...help environmental decision-makers to have a national overview of the environment...”
- Is it possible to have results based on indicators without a discussion of why they are being measured/what they are for?
- The report misses the mark as a tool for the “public.” It should be called something other than the “public document.”
- If EPA is going to do a “Report on the Environment” - it should include all environments - e.g., forests, rangelands, grasslands, etc. This report should not just be about EPA’s mission.
- There are other federal agency efforts to report on the environment (e.g, National Water Quality Assessment, EMAP, National Park Service documents) - EPA does not have to cover everything.

B. Value of Two Documents

- The document (ROE) is too overwhelming for the general public. It should not be more than 20 pages and written at a lower literacy level. It could be published in multiple languages for different regions of the country.
- The ROE was wonderful for this audience (attendees at the National Dialogue - environmental “decision-makers.”)
- If the document is expected to be used by the American public it should be no more than 5 pages, replicated annually, and supplemented with a technical version produced every five years.
- The ROE should not be “dumbed down” for the public, but rather supplemented by specific regional and statewide reports. It should not be so generalized that the public doesn’t understand where it is and isn’t safe to swim, for example
- A document about ten pages long should be produced, that contains simple bar charts that show the condition of air, land, water, etc.. This should be produced annually.

C. Usefulness and Order of Chapters

- The Human Health Chapter is problematic. Some health effects are highly related to lifestyle and not directly linked to environmental issues, as represented in the report. Caveats should be used to clarify those health conditions that are not directly environmentally related. This is especially true in the blue boxes.
- The Human Health Chapter does not do enough to make connections between health and the environment. The health sections in each chapter are good and should be better tied with the Health chapter overall.
- There should not be a separate chapter on environmental health. Health linkages should be mentioned in the relevant media-based chapter (e.g., asthma in the air chapter).

- It is critical to have a health component somewhere in the report - as most environmental regulations are written for the purpose of protecting health.
- Much of what is done at EPA emphasizes human health, it would be good to consider all aspects of the environment more comprehensively.
- The order of the chapters is wrong. The Ecological Condition and Human Health Chapters should be at the front. Humans are part of the environment and should be described as such. Then the stressors can be described. (Two participants made this comment.)
- There should be more emphasis on ecology.

D. Improving Understanding

- The “questions” provide a good way to frame the document.
- The Executive Summary did not summarize the highlights from each section (just described processes). There is not a list of priority needs in the Executive Summary. This would be helpful to EPA as well as state and local governments. Putting out a summary list of priority needs/gaps would help other federal agencies to work with EPA to fill the gaps.
- The report should describe what EPA is doing to improve the condition of the environment.
- The report should attempt to separate national activities from those that are supported at the state level (e.g., there are waste pesticide collection programs in 46 states that remove hazardous products from the environment).
- Trend data are presented inconsistently. It is difficult to tell whether the environment is improving or not. It’s not obvious whether ozone is good or bad - as there is no context presented in terms of how it affects the environment. Indicators at different resolutions should be linkable - how can someone determine what the condition of the environment is where they live? A bigger picture perspective would help to provide context and linkages. (This might mean using more “indices.”)
- EPA should show its biases up front to provide context - what the agency thinks is “good” or the “goal.” Making more clear the starting point, where things are now, and where things are headed would be useful. Talking about “tons of TRI emissions” does not tell the public what they should be concerned about. EPA should describe what matters.
- In many cases, it is difficult to tell the “baseline.” What does good mean? (e.g., in the graphic on pg. 2-6). How much have things changed? What is the goal and should progress be measured towards that goal? In some cases the indicators themselves appeared to be the goal, rather than the condition of the environment. It may not be appropriate that this report is the baseline (e.g., starting to assess condition beginning now). The present condition should not become the “goal.”
- The document simply presents data without providing a sense of purpose toward improving the quality of the environment. It would be useful to have some specific examples [e.g., when EPA did this (AQ standards) - the result was this (reduction in pollutants)]
- The document needs to provide a definition for “indicator.” There are widely varying interpretations of this word.
- The public should not have to stretch to see the connections between the environment and health - the report should help people make these connections.
- The report should clarify the use of the words “quality” and “condition.”

- Other federal agencies should be involved in the development of the next report as soon as possible.
- There should be more opportunity for input into the process as the document is being developed.
- EPA should try to identify the needs of its state counterparts for indicators.
- There should be a better discussion of methodology and how the issues, questions, and indicators were selected and how they relate. This might help to define the audience. Did EPA formulate the questions because they were of interest to the general public? The discussion should focus on “what do we measure? Why is this indicator important? What is the condition? What is the quality? What are the limitations? Etc.”

E. Frequency and Format

- A web format should be considered for the next report. This will allow the reader to drill down using hypertext to acquire additional detail on a subject while still leaving the document at a summary level.
- Use the web to be able to search geographically/regionally to get more detail on various subjects.
- The report should be web-enabled to allow an interactive query function - ask questions and receive indicators, or look at indicators and frame questions.
- Generate the report every 3-5 years. It should be done as well as possible, rather than worrying about an annual publication.

Discussion 2: ROE Issues and Questions

Participants were asked to address the following questions.

- A. Are the right “issues” identified? If not, what should they be?
- B. Are the questions appropriate for the issues? If not – what should they be?

A. Issues

- EPA should utilize available national surveys that document the environmental issues the public is concerned about.
- The “Children’s Environmental Health Issues” section is good.
- The discussion of freshwater resources should include the effects and prevalence of invasive species.
- Invasive species across all ecosystems should be addressed.

B. Questions

- The methodology used to select the questions should be clearly described. How were decisions made about what to include?
- The ecological condition questions do not address how the function of the ecosystem has been affected (e.g., Is the health of the natural environment adequate to sustain what we do to it?). Current questions are very simplistic.
- There are several questions and indicators that could be nested (no specific examples offered).

- Under the discussion of chemicals in the environment, there should be a discussion of endocrine disruptors and genetically modified organisms.
- The report should describe environmental exposures in terms of the risk “audiences” (e.g., Native American communities that subsist on fish from polluted waters).
- The report should expand its definitions to include statements such as: “The American Cancer Society reports that 3 percent of cancers are environmentally caused.”
- There should be a description for each question of how that question fits into EPA’s mission. If the questions respond to regulatory responsibilities, that should be so stated.
- The questions presented in this report should be informed by an overall strategic plan, not the other way around. The strategic plan should drive the questions, goals can be established, and progress measured toward the goals.
- It would be helpful to list all of the questions that EPA did not try to answer, perhaps in an appendix. This would help to clarify what the ROE is intended to do and not do.
- EPA should use a model based on systems ecology for the next document, (e.g., how do the major pieces fit together?).
- Global warming and sea level change should be addressed.
- There is not enough emphasis on groundwater (quality or amount).
- Water quantity is an important issue, along with the quality of groundwater (especially as a private drinking water source). A discussion of this topic should be included in the report.
- The report should contain environmental citizenship measures (e.g., general environmental knowledge, per capita energy use, water use, recycling habits, etc.).
- General climate information is missing from the document, (e.g., rainfall, regional droughts, etc.).
- The report could be organized in different ways to manage the number of indicators. These might include by ecosystem structure and function (e.g., media, processes, stressors), by biomes (e.g., grasslands or estuaries), or by stressors (e.g., urbanization, air pollution, changed ecological conditions).

Discussion 3: Report Indicators

Participants addressed the following questions:

- A. What other indicators/data would be useful? (e.g., regional, state, local?)
- B. How should they be “integrated” with National indicators?
- C. What are the least important indicators?
- D. Most important or “priority” indicators?

A. Other Indicators and General Indicator Comments

- Link administrative and outcome indicators to show performance changes. Indicators should be chosen relative to EPA goals.
- The document should present EPA’s goals to provide a context for the indicators (e.g., what percentage of coastal waters are meeting national standards?).

- Think about indicators that will help change behavior. Many indicators are lagging (after the fact), but they are a useful place to start. Have to find indicators that “lead” (e.g., in private industrial context - a good measure is number of employees trained in safety). Need to take a long term look on what it will take to change environmental behavior.
- Many of the indicators are not really dealing with ecosystem health. They are looking more at static conditions of land or water. The report should take advantage of more of the indices that have been developed on ecosystem health (e.g., atmospheric heavy metal pollution, plant biodiversity, sources/sinks of nitrogen).
- The air section has a lot of emphasis on acid rain but lacks other air pollutant issues, such as tropospheric ozone, nitrogen deposition, and bioaccumulatives (e.g., metals). Ozone effects on shrubs should be included..
- The report should discuss mercury deposition and air toxics. The report has too much emphasis on the criteria air pollutants (NAAQS).
- The water indicators do not address water chemistry (dissolved oxygen, pH, connectivity, turbidity, etc.).
- The indicator for clarity is not appropriate for coastal waters - there is a lot of variation across the country.
- Discussion on the abundance of healthy fish and wildlife communities should be included in the report.
- More details on the extent of habitat would be useful.
- In the Technical Document there should be more use of indices for plant and animal species.
- The report does not address the fragmentation of aquatic systems and how this affects in-stream processes and sediment moving through aquatic systems.
- Fragmentation and habitat corridors should be considered.
- The report should address the loss of priority wetlands.
- The loss of flow through the removal of fresh water should be mentioned in the report (In the Mississippi Delta this is a big issue.)
- Source tracking of bacteria in recreational water sources should be included.
- Change in concentrations of certain pollutants is a better indicator than fish advisories (as these are done differently based on different criteria in each state).
- Consumption advisories for wildlife other than fish could be considered (e.g., ducks).
- The report does not contain indicators for chemical applications and pesticides from lawns and golf courses.
- The report should address what percentage of Superfund sites still contain residual contaminations that could be a problem for fish and wildlife.
- The persistence and accumulation of medical waste is an important issue to track. This is currently not represented in the report.
- The forest section does not address nitrogen-based and ammonia-based deposition.
- Erosion is covered in the soil section but not soil characteristics, such as pH, cation exchange

capacity, and other aspects of soil chemistry.

- Indicators should be contextualized relative to natural variation. For example, the water chemistry of estuaries varies greatly depending on the type of forest and soil of the drainage.
- Some of the forest-related indicators are similar to those found in the Montreal Process². (More of these would be useful.)
- The blue boxes describing health indicators are misleading (e.g. pg. 4-8). It is hard to understand the environmental and health linkages represented in the graphics without first reading the narrative. Better connections need to be made to the environment, rather than just a list of health conditions.
- It is important to keep the health indicators, as they are the reason that many environmental regulations are written.
- In the health section, there is no difference between the indicators and the questions. This is the only chapter where this is the case.
- If an indicator does not help to define or understand an organizations mission, it should not be used.
- The children's environmental health indicators miss the mark. Should replace childhood asthma mortality and childhood asthma prevalence (these are not necessarily environmentally linked) with something like hospital visits due to asthma triggers. Similarly children's exposure to pesticides and hospital visits.
- Trends should be included whenever possible.
- The Technical Document includes a lot of forest indicators that are not in the public report and could be.
- The graphic of coastal conditions on page 2-6 is a good example of an effective use of indices. This provides a "report card" type reporting, which is useful.
- Meshing the various scientific views of the arrows on the "report card" or "dashboard" is difficult (e.g., pg 2-6) - the science of what is being measured must be made clear.

B. Integrating indicators

- There is value in a national report, but state and local information should be coordinated. This includes how the indicators are organized. There is a lot of theoretical work published on indicator models [e.g., the Drivers-Pressures-State-Impact-Response (DPSIR) framework]. Many groups are using the DPSIR model. EPA should make sure that its indicator framework is compatible with these and other efforts.
- The report should have specific examples of local indicators.

²In 1993, a United Nations committee convened an international seminar in Montreal, Canada on the sustainable development of temperate and boreal forest. This conference led the United States and nine other nations to form the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forest. This working group became known as the "Montreal Process."

C. *Least important indicators (participants were asked to identify one)*

- Indicators that only reflect the extent of a certain landscape condition (e.g., grassland, forest. etc.), unless it is in the context of diminished ecological function.
- Human health indicators that are not directly correlated with environmental conditions (e.g., infant mortality, cardio-vascular disease, cancer incidence, cancer mortality, typhoid, cholera) (10 comments on this)
- Altered freshwater ecosystems
- Landscape trends (e.g, acreage of cover types)
- Combine some indicators such as toxics and PBT's and discuss as chemical contaminants in streams and groundwater.
- No specific recommendations on which are less important, but a smaller number would be much better. A lot should be taken out (e.g., anything dealing with extent or weights - e.g., acres of grasslands or tons of emissions).

D. *Most important or priority indicators*

- Ecosystem functions - biodiversity and productivity.
- Land loss in Louisiana (Mississippi drainage).
- A comprehensive index of environmental quality overall
- Everything is important. But information should be organized around biomes or ecoregions - broad statements about general land/water quality nationally are not useful.
- Biotic function of aquatic systems (e.g., benthic organisms)
- Indicators that can be compared to national goals or conditions.
- Do not force all indicators at a national level - focus on what is important/appropriate regionally/locally.
- Air quality measures
- Leading health indicators from "Healthy People 2010"
- Indicators that mirror environmental health priorities such as 1) enteric diseases (e.g, salmonella, food born illnesses); 2) blood lead; 3) chemicals in wells (e.g., toxins from dry cleaners, NPL, and gas stations); 4) small contaminated sites not on the NPL caused by LUST and wastes; and 5) radon, mold, indoor air as it relates to asthma.
- Indicators that track clean, potable water.
- Acres of wetlands lost, number of imperiled streams
- Indices of healthy wildlife and their habitats, including community structure of plants and animals.
- Indicators that can be reported with actual numbers to show trends, rather than quality assessments, especially if these can be compared to national goals. Measures of the ambient environment.
- Key stressors and responses to those stressors that alter ecosystem processes (e.g., changes in land use, loss of ecosystems, air pollutants, exotic species, exacerbated natural stressors such as storms beyond their normal intensity and fire conflagrations)

- Indicators related to EPA's responsibilities (but consider performance not just compliance) - address goals such as swimmable, fishable, drinkable
- Water quantity measures
- As many indicators as possible (do not try to delete indicators) - as "drill down" to local levels, more will likely be necessary

Discussion 4: Use of the Document

Raffael Stein from the EPA Office of the Chief Financial Officer provided an overview of EPA's plans to align the ROE and strategic planning. EPA has been criticized for not being able to show a clear relationship between the agency's work and changes in environmental conditions. The ROE is an important first step in moving to fill these data gaps. He said that environmental indicators are not necessarily good performance measures, but that targets for annual performance goals are part of the strategic planning process. EPA would like to be able to identify specific gaps in environmental knowledge based on the ROE, with the intent of developing budget proposals in various program offices to address these gaps.

Participants were asked to address the following:

How has the report been used or might it be used and how might indicators be aligned with planning and performance?

- The Fish & Wildlife Service is also (as is EPA) struggling to find indicators that will correlate with agency performance measures. The ROE will provide some good lessons.
- The ROE can provide a yardstick to be used by other federal agencies. It identifies current trends which could help to set future goals (where could we be in 30 years if this trend continues). If trends are not positive, alternative courses of action can be identified. This may have to be addressed on a state by state or region by region basis.
- This starting point provides a way to help think about the environment more holistically - how land use and transportation planning could be integrated.
- The mission of the USDA Extension Service is science-based education and outreach. This report is a good reference for educating the public. This is a great document to verify some of the research needs of the land grant institutions - and to justify some of the funding needs.
- The ROE might be useful to identify milestones that will move the nation towards an improved quality of our natural resources. This will have to be based on a feedback loop.
- These indicators are useful to 1) set future goals, 2) correlate activities that result in environmental improvement. This has to be done frequently enough to actual track what is changing. And there has to be a willingness to commit resources to make it happen. The states bear the burden of monitoring - there needs to be a consistent methodology and resources to optimize their ability to do this.
- The ROE helps thinking about environmental integrity and how to improve quality overall.
- The report provides a fantastic reference.
- The report provides a good starting point for partnerships on what needs to be done for indicators,

including standardized protocols.

- The ROE is useful to begin thinking about the “right goals” and how to measure performance towards them. How can things that are prevented from happening be measured (e.g., fires prevented or pollution prevented)?.
- The report allows comparisons of local indicators to national averages.
- The report provides a useful reference for many sources of data.
- The ROE raises useful questions about analytical approaches - metadata, how to set thresholds, how to determine “good” conditions.
- Focusing on strategic planning as the next step is a good idea - it should have come first. It sets in place what the indicators can be used for and what indicators are needed.
- These indicators, based on science and best professional judgement are a useful starting point for setting goals. Now those goals should be continually examined and performance measures for accomplishing them developed. But these measures are different than indicators.

Public Comments.

Dr. Erica Frank read from and submitted comments. She expressed concern about environmental policies in the U.S. including an apparent disregard for global warming and clean air. She believes that current energy and pollution policies are flawed.

Dr. Ed Arnold, as a private citizen expressed his concerns that an EPA Report on the Environment should help spread understanding about how the U.S. fits in the ecosystem of the world, and consider the need for resource availability within the global community. He encouraged EPA to look at population growth and rates of resource consumption. Similar to the Heinz Ecosystem report, he suggested that EPA should show graphically what it does not know, not just what it knows. Executive Director of Physicians for Social Responsibility/Atlanta read from and submitted comments.

Closing

Meeting participants expressed a desire to have more opportunities to influence the report, including the incorporation of additional information resources. They would like to see stakeholders brought together to share information on specific indicators for inclusion. A process for doing this should be developed. They noted that the overarching goal of this entire effort is to ensure environmental sustainability and that involves everyone.

Participants

Phil Bass, Mississippi Department of Environmental Quality
June DeWeese, U.S. Fish and Wildlife Service
Linda Disney, City of Atlanta
Paul Garbe, National Center for Environmental Health
Anne Gilliam, Southern Alliance for Clean Energy
Marlin Gottschalk, Georgia Department of Natural Resources
Holly Greening, Tampa Bay Estuary Program

David Jacoby, Georgia Pacific Corporation
Aaron Keatley, Kentucky Natural Resource and Environmental Protection Cabinet
Alice Miller Keyes, Georgia Conservancy
Leslie Montgomery, Southern Company
David Owenby, Tennessee Department of Environment and Conservation
John Shipp, Tennessee Valley Authority
Ken Stolte, Forest Health Monitoring Program
Bob Vincent, Florida Department of Health
Don Willard, Mecklenburg County Air Program
Joe Devivo, National Park Service
Diane Beeman, US Fish and Wildlife Service
Genie Strickland, Sierra Club
Tommy Gray, GA Department of Agriculture
Lisa McKinley, USDA - CSREES
Barney Tunney, B.N.A, Inc.
Peter South, EPA OEI
Laura Williamson, EPA Region 4
Ravi Rao, EPA Region 4
Tom Hansen, EPA Region 4
Cory Berish, EPA Region 4
Raffael Stein, EPA HQ OCFO
Ronald Shafer, EPA OEI
Tom Baugh, EPA Region 4
Kim Nelson, EPA OEI
Beth Walls, EPA Region 4
Ken Clark, EPA Region 4
Steve Young, EPA OEI
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Suzanne Annand, EPA OEI
Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
Kevin Pierson, Ross & Associates Environmental Consulting, Ltd.

APPENDIX C
U.S. EPA's National Dialogue on the Draft Report on the Environment (ROE)
EPA Region 5
Chicago, Illinois
November 6, 2003

Overview

Participants, representing a diverse cross-section of sectors and interests, actively engaged with EPA representatives for several hours, providing substantial and constructive comments on the 2003 Draft Report on the Environment. Several common themes emerged during this dialogue including:

- the suggestion that EPA consider how to improve linkages between national, local, state, and regional indicators
- the need to address the complexity of the climate change issue and to include objective measures (not value judgements) such as CO₂ levels, temperature, climatic events
- the suggestion for inclusion of more information on the causes of certain trends or conditions (e.g., changes in air pollutants, energy use)
- the value of the ROE for different purposes, including comparisons to national averages and justification for funding to fill gaps.

Welcome

Tom Skinner, Administrator, EPA Region 5 welcomed participants to Region 5. Kim Nelson, Assistant Administrator, EPA Office of Environmental Information provided an overview of the ROE, including key findings. She described the purpose of the National Dialogue as a means to solicit feedback from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public. Feedback would be useful on overall impressions of the document, information needs, gaps and approaches to filling them, and uses for the ROE, including alignment of indicators with planning and performance. The emphasis of the ROE is on the present, not projection of goals for the future. She noted, however, that the ROE has changed EPA's thinking about its strategic goals, reducing them from more than ten to the current five, which closely mirror the chapters in the ROE.

In the following discussions, participants focused their comments almost entirely on the "Public Report" and not the Technical Document. Many of the indicators that participants suggest below to fill gaps in the Public Report were included as "category 2" indicators in the Technical Document.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)

Participants were asked to consider the following:

- Overall impression of the document
- The value of having two documents - a public report and technical document
- The usefulness of the media and outcome chapters, including the order
- What EPA could do differently to improve understanding
- The frequency and format for publishing a ROE.

Overall Feedback

- The writing, graphics, and photographs are exceptional. Color and overall formatting make the ROE easy to read.
- Undertaking the development of the ROE clearly was a tremendous and commendable effort.
- The audience is not clear - whether it is the “American public” or resource managers. The Public Report is better suited to a lay audience. Environmental professionals are much more likely to find the Technical Document useful for their work.
- It is a broad report that is an excellent first attempt to establish critical baselines. From these baselines, trends can be developed with more scientific data. (This is a long-term process.)
- More detail in some areas would be very useful, specific examples (e.g., lead) capture attention.
- The various timelines used to present data are confusing. The inconsistencies raise questions about why and how data were chosen for inclusion.
- More recent data would be an improvement, however, where long-term trends exist these should be used to provide context for the trends that are reported (e.g., wetland loss may be slowing, but significantly less exists than historically).
- Better linkages between indicators and EPA activities would be good.
- The three media chapters make sense to the average reader - this is how many agencies organize their information. It was suggested that having the Ecological Condition chapter directly follow the media chapters (before the Human Health Chapter) would help the flow and connections. There were varying opinions on the order of the chapters.
- The ROE could be published on-line and updated data provided between publication of hard-copy versions. If data can not be provided directly, providing users with a link to the data sources would be useful. This would be useful for helping to search for data. (There were some concerns expressed about security issues with web access.)
- Additional reports that provide more detailed data at the regional level would be useful. Alternatively, including additional data that are regionally-specific (where available and appropriate) would add value.
- A timeline should be established for how often and when the ROE will be issued.
- It would be appropriate to change this from a “draft” to a final report.
- A discussion of how the ROE is integrated with and related to recommendations from the Pew Reports on environmental-health (including the merger of the CDC National Center for Environmental Health and the Agency for Toxic Substances and Disease Registries) would be helpful.
- It would be more effective and easier to interpret if consistent units of measurement were used. Both absolute numbers and percentages should be presented to provide context (e.g., number of acres and percent change in land use).
- The ROE should consider more holistic and cross-media ways to present data to encourage better understanding of the interrelationships between the issues. How the U.S. fits in the

global context on specific topics would also be helpful (e.g., comparisons to other developed nations).

- More information on monitoring and information about why monitoring is important would be useful.
- Future reports could build on ten regional reports developed in the same format. This would create opportunities to delve deeper on specific topics or in specific geographic areas and provide more meaningful data for many users. Regional compilations should still allow development of and changes in national indicators. Data quality for indicators at all levels would need to be addressed.
- The ROE provides a good start/lead for indicators that can be replicated locally.
- There is a concern that the Bush Administration is providing misleading information that is not consistent with the available scientific data and/or suppressing scientific information on important issues (e.g., climate change).
- EPA should mention local indicator efforts around the country. This could be done through web-links. Maps could link to other efforts.
- It would be useful to provide context of how the US compares to the world at large in terms of many of the indicators.
- Some data are not useful to report nationally (e.g., groundwater extraction).
- There are categories or suites of indicators that may be useful for reporting (e.g., indices) that better integrate information about systems. These may be a better approach for discussing specific systems.
- The ROE should track emerging environmental issues.

Overall feedback on specific areas of the report

Air

- Many of the indicators are presented as absolute measures (e.g., air quality standards) when they are actually a judgement call. The “bar” changes over time, so the indices may report different things. It would be useful to describe the process that EPA uses to set these standards. It’s important to make this clear when making comparisons and to identify the basis for the standards.

Human Health

- Collaboration with the Department of Health and Human Services and CDC for future reports would be helpful. Some of the health data are inconsistent. More data, more examples, and “tighter” examples of human health issues such as asthma or pesticide exposures are needed.
- The overall description of lead is too focused on the 1970's and air pollution. There are (at least) two separate issues—one is exposure to lead through air (which EPA has done a good job of addressing), the other is exposure through other sources such as paint.
- The health chapter is very good. It provides more information than have some other environmental health tracking efforts.
- Childhood lead poisoning should be discussed as a disease rather than exposure—this is how

it is referred to in public health circles.

Discussion 2: Information Gaps

Participants were asked to consider:

- Are questions in the ROE the “right” ones? If not – what should they be?
- How well are the questions answered by the indicators/data?
- What other indicators/data are needed?
- What are the priorities for other indicators?
- What other specific indicators at regional, state, or local scales would be useful?
- How should they be “integrated” with National indicators?

General gaps

- Invasive species should be discussed in several chapters (e.g., land, water, and ecological condition) including the effect of these on various media, ecosystems, and industries (e.g., fishing).
- Fragmentation, both in the landscape and in water habitats, is not discussed and should be.
- Causal factors and information on pollutant sources are missing.
- Information on environmental justice (e.g., exposure levels for sensitive populations) appears to be minimal or, in some areas, missing. This information should be included in future reports. Data could be used from other agencies such as HUD (e.g., on sub-standard housing). There could be something in each chapter such as vulnerable populations.

Gaps in specific chapters/issues

Air—Climate Change

- Include climate change trend information, even if the information is imperfect. Some information is better than none. Appropriate caveats and information about level of certainty in the data should be included.
- A description of the process of working through the climate change issue would be useful.
- Not including information on climate change, including a simple statement that climate change is an important issue, was like putting a “kick me” sign on EPA’s back.
- Climate change should be addressed in the next report, especially because the report is intended to drive strategic planning processes by EPA and other agencies. Simply saying that climate change is a complex issue is not enough.
- President Bush has established a measure on greenhouse gas (GHC) intensity (GHG intensity measures the ratio of greenhouse gas emissions to economic output, usually expressed in terms of gross domestic product). This could be considered as a future climate change indicator.
- It should be possible to pick a few climate change indicators that are objective and not value

judgments—this approach was effective in the rest of the report. Using such indicators would likely obviate the need to even mention that the data are controversial.

- The level of knowledge and gaps should continually be discussed. This is different than simply providing transparency. It's important not only to report on what's being done, but what the bigger picture is of what needs to be done in environmental protection.
- A discussion of approaches to conservation (e.g., the use of less fuel) should be included as it contributes to climate change.
- EPA should discuss how other media are affected by climate change. It is not just an "air" issue.

Air—Other Gaps

- Information is available (e.g., on air toxins) that was not included in the report.
- There is a lack of information about mercury in the air chapter (e.g., how mercury in the air can affect fish). The connection of acid deposition and its effects on fish should be clarified.
- There should be more information on the sources of air pollutants, especially in the ambient air discussions.
- It would be useful to know what agencies, including local jurisdictions, are doing about air pollution.
- More information on the reasons for trends (e.g., pollutant increases or decreases) would be useful. People want to know what has been successful and why things change.
- Some discussion about the intersection between vehicle miles traveled (VMT) and public transportation would be useful.

Water

- More information on groundwater should be included —both quantity and quality. How many states have comprehensive groundwater plans/issues?
- EPA should tell the story behind the data on fish advisories. These are measured differently by every state. The more pollutants are looked for, the more they are found.
- The report does not mention the State of the Lakes Conference, a joint effort between Great Lakes agencies and Environment Canada. The Surface Ocean - Lower Atmosphere Study (SOLAS) project has been developing indicators that would be good additions to the report.
- There is a lack of information about the linkage between water quality and quantity.
- In some instances, available historical trend data were not included (e.g., historic levels of wetlands beyond the last fifty years). Providing these data would give readers a more complete context. They can be included even if there is less certainty about the reliability, as long as the level of certainty is reported.
- A discussion on endocrine disruptors should be included in the water chapter.
- It is important to include information on perennial streams with respect to water quality and health. Perennial streams are about 70% of watershed-based streams, but they are almost completely ignored in both monitoring and scientific assessments.
- The three indicators under the question about the condition of coastal waters are all highly

correlated with one another and therefore are not distinct. This isn't made clear. Other indicators could be selected such as shoreline modifications, invasive species, water levels. An indicator that provides data on the extent of hardened shorelines or dyked wetlands would be useful.

- It would help to identify what the right measures are to start with. For instance, there may be different biological indicators (for water) and these indicators may vary from place to place around the country. Biological indicators are likely to be the best indicators for water. States may want to have a single set of goals around these indicators, even if the specific indicators vary.
- An indicator should be included on natural versus altered/modified channels.
- One possible indicator could be the ability/capacity to do monitoring work or how much monitoring is going on, and of what quality, etc.
- More information on water quantity in general, including flow and distribution (e.g., flow and pumping) and a discussion of who gets what water when would be useful and would help people to see things from a landscape perspective.
- Michigan DEQ has just finished a document that includes information on the quantity of water and includes cross-border information. They found that there are major data inconsistencies and that the data are not in a format that most people would find useful. These findings mark a water data gap.
- There should be an effort to aggregate data (e.g., stream ratings data) in some way, even if states use different measures. IBI is one way to do this, but it is difficult to assess "undisturbed" conditions for streams.
- National-level data sometimes leave a skewed impression when there is regional variation—need to be clear about significant regional variation in the data (e.g., groundwater recharge).
- If the 2002 state-based water quality inventories indicate that water quality is getting worse at the state level, these data should be included. General overall water quality data are missing.

Land

- There needs to be a discussion of fragmentation in this chapter. Some of the fragmentation data could go beyond the obvious categories and include agricultural fragmentation, parcel fragmentation, and changes in ownership over time, which have impacts on forests, wildlife, and ecosystems in general. (The average length of ownership of private forestland parcels is 7 years. As land turns over, goals for management change, affecting land uses and services.)
- When examining land use categories, such as urban and suburban, having a more specific breakdown could help land use planning and policy decisions.
- The economic (e.g., ecosystem services provided by wetlands) and social values of certain land cover classes and land uses should be discussed.
- The geomorphology and how land surfaces have changed over time would be useful to discuss as they affect nutrient levels, and how these have changed, and how historical levels will not be achieved again.
- The effects of global warming on habitat fragmentation and land cover should be included.

- There might be consideration given to an indicator on “risky behavior” (e.g., people building in flood plains and the urban-wildland fringe fire issues). These have impacts on land cover and ecosystems.
- The forest information focused a lot on the number of acres of forest land, but was lacking information about the kinds of trees and forest types. There should also be discussion about the wholesale change in forest types in some areas of the country due to management practices and natural events and major disturbances.
- The Forest Inventory and Analysis is a good source of data, even though it does not cover all forest lands in the nation.
- Information on land use alone does not define the condition of the land. It would help to also explore what the impacts of particular land uses are. For example, fishing may be safer in agricultural lands than urban lands. The National Resources Inventory could help to examine issues, such as the amount of erosion coming from land use types and wind and water erosion by region. These types of statistics would be more useful than just discussion of the number of acres.
- Information about the importance and effects of conservation is missing. The NRCS has a Performance Results Measurement System which includes data at the county level on such things as acres of buffers that have been installed. The National Resources Inventory could provide a baseline for these data. This system is evolving to track all conservation practices installed (approximately 1600 different treatments). The data are available on-line in a system to be called (PRS).
- The challenges to collecting good land cover/land use data (including data on forest types) should be acknowledged at the beginning of the chapter or sections. It is good to be up front and realistic about the data that are not likely to be available.
- In the chemicals section, caution should be used on how information on pesticides is communicated—this is not nearly as big of a problem as the public thinks it is.
- Some indicators should be developed to talk about changing agricultural practices and the effects on the environment (e.g., Confined Animal Feeding Operations (CAFO’s) and changes in the intensity of agricultural operations.).
- A discussion of the population growth effects on ecosystems should be included in the Land Chapter.

Human Health

- Wildlife diseases are important to report, as well as human diseases (e.g., Chronic Wasting Disease, West Nile Virus, endocrine disruptors).
- Expand the current cooperative agreement concept to other agencies, such as CDC and health departments, so that a broader set of agencies would be collecting consistent data in a consistent manner.
- The Wisconsin Department of Health and Family Services has indicators on exposure that may be useful.
- National Health and Nutrition Examination Survey (NHANES) data should be included in the next report.
- Health disparities should be reported (e.g. vulnerable populations). There is some discussion

about race under various diseases, but more information about poor or disadvantaged populations and disparities in health relative to where people live would be useful.

- It should be clarified whether the exposure to radiation includes UV radiation.
- The indicator effort being undertaken by the Council of State and Territorial Epidemiologists (and other indicator efforts) should be crosswalked and coordinated with the EPA's Environmental Indicator Initiative.
- The asthma discussion should include other environmental contributors such as cockroaches and dust mites.

Ecological Condition

- There are many category 3 and 4 indicators [sic] in the Technical Document that merit attention, and if possible, additional funding, so that over time they can become category 1 and 2 indicators.
- If EPA were to work more closely with the natural resource agencies, additional biological data would probably be revealed, especially at the state level. In the Illinois State of the Environment reporting, biological data across ecosystems is a major gap. They have tried to use satellite data to address these gaps and are currently looking at various multi-metric approaches including birds and plants to correlate with human disturbances and stressors. There are 600 sites, of which, 150 are sampled annually. These are similar efforts to IBI - which are likely to be slightly different in every state. The states could work with EPA to define a common approach.
- The “master stations” approach, a sampling technique for a variety of parameters, could help with ecological monitoring. There are various national efforts that attempt to do this (e.g., EMAP and FIA) as well as state activities. Sometimes these sites are based on priority conditions and are not sampled consistently over time and results cannot be aggregated. There needs to be a multi-tiered approach to be able to track trends.

Discussion 3: Report Use

David Ziegele from the EPA Office of the Chief Financial Officer described how the indicators will serve as an important tool in priority setting in the next Strategic Planning cycle (which will begin in 2004 for the 2006 Strategic Plan). For management purposes, it would be beneficial to use the indicators to identify where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past, but this will require establishing a good baseline. Annual planning requires setting annual targets—even a subset of high quality indicators would be a signal of willingness to commit to a set of measures as part of the annual plan and budget.

Kim Nelson explained that there will never be 100 percent alignment between the ROE and the Strategic planning efforts because they are different—measures and indicators are going to be used for different purposes. These are overlapping, but not congruent circles. The EPA Strategic Plan, for instance, will not likely include topics such as cancer rates and measures that are from other agencies. Those items that are in the annual plan and budget have to be measurable on an annual basis.

Participants were asked to consider the following questions:

- How have participants used the report?

- How might participants use it in the future?

General Comments on Use

- The ROE is useful for many states to compare and contrast their conditions with national averages and patterns.
- The ROE has helped to validate state environmental indicator programs. EPA should continue to try to link with states to make the data more useful. Some states realize that their 305b efforts should be probability based. Annual measures are often not useful as environmental indicators because the latter do not change that quickly.
- EPA should consider how to get the report into high schools. One participant noted that charts and tables from the report should be available for cutting and pasting and presentation in the classroom.
- States are likely to find the ROE useful to compare their numbers to national averages.
- States will find the ROE useful when communicating among agencies and when requesting resources from state legislatures.
- The ROE can help to emphasize that indicators are not just programmatic measures.
- Providing a timetable for production of the next report could have the effect of getting the environmental community to transcend the politics that ebb and flow with the change of administrations. EPA should continue to make this a “science-based” report.
- The NRCS would use the report to point out that the NRCS data were used and that the NRCS practices make a difference. There is some concern that not including more conservation data can lead to misleading conclusions about negative trends (because conservation practices were not accounted for).
- The US Forest Service is focusing more on outcomes than outputs and the ROE will help to do that. The report is more useful at the national level than at the Ranger District level in National Forests. It could be useful to the USFS’s State and Private and Research and Development branches to help identify research needs. The US Forest Service is about to initiate another round of Forest Plans (and grasslands), the ROE will be useful to help set the stage for those plans.
- BP noted that it has found a disconnect between data it had been collecting and what is most important to local groups and the public. BP has shifted to examining its policies and programs and determining what it can do that is important locally (e.g., ISO certification) and then setting indicators and goals. They do not believe it’s realistic to expect all pollution or other environmental contributors are going to go to zero. More research is needed on the science of human health, biological pathways, and the environment.
- The report will be useful to begin to rank priorities by state. This will help with resource allocation. EPA should consider tapping the extensive knowledge and expertise of the retired workforce.
- The ROE can contribute to a discussion with states about gaps.
- There is not a lot of application at the local level, especially for smaller municipalities (except for some land use data). But even with smaller communities, the report will help to set context. It provides a reference for grant applications for local jurisdictions to be able to

identify appropriate measures. The ROE will give the public a good reference for the environment and the beginnings of a dialogue, processes, and results.

Public Comments

Caroline Herzenberg presented written testimony. She pointed out that many scientists are deeply concerned about what appears to be a pattern in the Bush administration of providing misleading information by omitting or downplaying important scientific information. She believes that there are gaps in the report, stating that “in a glaring and deliberate omission, the EPA assessment does not discuss worldwide climate change.” Additionally, “the report ignores important data in various other areas. For example, rather notably, it ignores significant data on water quality that has been collected by the states.” She also points out that she believes the report should address the future and not just historical trends. She would like to see a strengthening of environmental protections.

Feedback on the Discussions

- A session should be held in Washington, D.C. to involve people on the east coast and the national organizations that have representation in DC.
- Participants should be told that there are two reports to review.
- The meeting provided a good structure for expressing views. Participants felt that they had ample opportunity to share their views.

Participants

David Baler, Illinois Department of Natural Resources
Keith Harrison, Michigan Department of Environmental Quality
Bill Pound, Ohio Department of Agriculture
Tom Sieger, Wisconsin Department of Health and Family Services
Carol Herzenberg, Herzenberg Associates
Dr. Irvine Solomon, Retired VP of The Gas Institute
Susan Zingle, Lake County Conservation Alliance
Ed Rankin, The Midwest Biodiversity Institute
James Gitz, Mayor of Freeport, IL
Anne Evans, Chicago Department of Public Health
Brian Urbazewski, American Lung Association Metropolitan Chicago
Jeff Muffat, 3M Environmental Technology & Services
William Gerwing, BP America
Roger Nanney, USDA Natural Resources Conservation Service
Russ Lafayette, USDA Forest Service
Kate Beardsley, US Fish and Wildlife Service
Richard Greenwood, US Fish and Wildlife Service
Dr. Rosie Sokas, Great Lakes Center for Environmental and Occupational Health Services
Lucinda Johnson, Department of Biology & the Center for Water & the Environment, University of MN
Kimberly Nelson, EPA Office of Environmental Information
Mike Flynn, EPA Office of Environmental Information

Heather Case, EPA Office of Environmental Information
Dawn Banks-Waller, EPA Office of Environmental Information
Tom Skinner, EPA Region 5
Cyd Curtis, EPA Region 5
Jay Messer, EPA Office of Research and Development
David Zieglele, EPA Office of the Chief Financial Officer
Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
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APPENDIX D
U.S. EPA's National Dialogue on the Draft Report on the Environment
EPA Region 6
Dallas, Texas
December 12, 2003

MEETING OVERVIEW

Participants, representing a diverse cross-section of sectors and interests, actively engaged with EPA representatives for several hours, providing substantial and constructive comments on the 2003 Draft Report on the Environment (ROE). Several common themes emerged during this dialogue, including:

- recognition of the effort that this document took to produce and the quality and value to the “public”
- concern that energy issues (e.g., sources, production, consumption, associated pollution) were not covered in the ROE
- perceptions that the ROE presents information in a way that can be misleading (e.g., data referenced to standards versus objective numbers)
- interests in seeing “quick-reference” sections in each chapter (or an appendix) to identify indicators and trends (e.g., scorecards), as well as a discussion of “what has been done” and “what a citizen can do,” and emerging issues.

MEETING SUMMARY

Welcome

Larry Starfield, Deputy Regional Administrator for EPA Region 6, welcomed participants to the Region 6 National Dialogue session on EPA's Draft Report on the Environment (ROE).

Kim Nelson, Assistant Administrator, EPA Office of Environmental Information, provided an overview of the ROE, including key findings. She described the purpose of the National Dialogue as a means to solicit feedback on the ROE from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public. The National Dialogue is designed to elicit feedback on additional information needs, gaps and approaches to filling them, and uses for the ROE, including alignment of indicators with planning and performance. There are two reports, a “Public Report,” sent in hard copy form to meeting participants, and a more detailed Technical Document, provided on a CD. These documents are not the same, but support each other.

Ms. Nelson emphasized that the focus of the ROE is on the present and is not a projection of goals for the future; however, the ROE has influenced EPA's thinking about its strategic goals, reducing them from ten to five, which closely mirrors the chapters in the ROE. She pointed out that the document does not include an assessment of EPA's performance and asked the participants to consider whether this is appropriate. She also asked participants to help EPA think about the indicators in the document, whether

the bar has been set at the right level, and identification of major gaps. One gap already identified is climate change, which was not included in the draft because the various researchers, reviewers, and scientists working on the document could not reach agreement on the language in time for publication. She fully expects this gap to be filled in the future.

In the following discussions, participants primarily focused their comments on the “Public Report,” with a few participants addressing the Technical Document.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)

Participants were asked to consider the following:

- Overall impression of the document
- Organization of the Report

Overall Impressions

State Government Participants

- Overall the ROE is impressive.
- The ROE could do a better job of distinguishing between qualitative and quantitative data.
- The attention to presentation is very good and contributes to making the ROE easy to read. (Several participants made similar comments.)
- Reducing the number of indicators to focus more on the most important or informative indicators may help to make this a more manageable endeavor.
- The challenges EPA must have faced in putting together the ROE are not unlike those that states have faced when developing their state of the environment reports. It would help report readers and, in general, agency colleagues, if EPA were more up-front about these challenges, perhaps in an introduction that explained the difficulties and assumptions.
- States appreciate the opportunity they were given to provide input on the report (e.g., at the Chicago meeting) when it was being drafted - and that those comments were incorporated.
- State agencies are looking forward to seeing more specific indicators that are relevant to states and EPA Regions, and learning more about what all of this means for future work.
- For the ROE to be most effective as a national report, it needs to provide comparisons to other nations.
- The lack of information on energy is a serious omission: everything associated with energy (production, consumption, etc.) has an environmental component. (Several participants made this comment.)
- The ROE would be strengthened if an economic component was added that explored how environmental conditions impact the economy and vice versa.
- The ROE initiative is certainly worthwhile, but the question immediately arises about how new data (to fill gaps) will be collected and what additional burdens might be placed on states to

improve and fill-in indicators.

Academic Participants

- The Ancient Greeks looked at the world through four lenses: air, water, land, and fire (meaning energy). A national report on the environment should cover energy issues.
- This report and others like it should look more at how environmental exposures, etc., affect humans and what kind of diagnostic tools for determining the environment/human health connection are available.
- The ROE is a slick, press-oriented document, not a scientific document for decision makers. It fluctuates between arbitrary statements and incomplete statements. For example, relative numbers on recycling are provided without any reference to the absolute number—this could be intentionally or unintentionally misleading. Most decision makers would be happier with raw data in a tabular form.

Local Government Participants

- The ROE is long overdue and greatly appreciated.
- The ROE should include energy-related information, which is one of the first things that some readers look for and are then disappointed and surprised when its not there.
- EPA needs to ensure that the information conveyed is not misleading, because there are many ways to skew data.
- EPA should think of the ROE as a comprehensive national report on the environment rather than as an EPA-centric report. The report should not be limited in scope because EPA does not have primary responsibility for some issues such as energy.
- The ROE looks good and is easy for a lay person to read. But as a person who wants to extract information from it very quickly, it is not very useful. Readers should be able to turn to the list of indicators and immediately see the information on each indicator, but each paragraph has to be read to find the information on the indicators.
- Rarely is someone in the public going to pick up the ROE and read it. Something such as a “quick glance,” is needed - that would enable readers to easily look at a list of indicators and find out what is going on. A format that could be distributed to citizens would be useful. This might be articles or links to web sites that would include regional or local supplements.
- The ROE contains a lot of information. EPA needs to make sure that the information is presented in a format that is suitable to the reader (e.g., National Geographic’s layout for its audience) and the current report is not quite there. Admittedly, putting complex ideas into a simple public-friendly format can be very difficult.

Tribal Participants

- The ROE is very impressive overall, even though there is still room for improvement. It is presented in layman’s terms that the typical citizen can read. Tribes need to be aware of nation-wide environmental issues and conditions and the ROE may help to get Tribes more

involved in environmental programs. Including more references to Tribes would help to increase tribal awareness and interest.

Federal Government Participants (non-EPA)

- The ROE was fun to read and nice to look at. It is obvious that EPA is under political pressure because it doesn't quite say what is and isn't going well. The executive summary is well written, but another synopsis to describe what is and is not working would be useful. Population pressures need to be stressed and how these may drive future directions.

Not-for-Profit Participants

- The ROE is impressive and very readable, especially given the short time frame under which it was developed.
- The ROE was well thought out and is probably the best that EPA has produced, but it also comes across as over-optimistic. Many facts are not addressed and some of the conclusions appear to not be true (or not entirely true). For example, the health of the general public is degenerating, not getting better, but this trend can be masked by advancements in medical technologies. In another example, the ROE overstates how safe the drinking water supply is, but the data show that water is really contaminated in many areas across the country.
- The report should address cross-boundary issues, such as airborne particulates and contaminants, and polar ice caps (which release mercury when they melt), but this is not addressed. Don't hide behind standards (e.g., pesticides above standards were found in only 1.4% of the foods tested - why are there any pesticides in food?) Also, there is no discussion of pesticides being brought into the US.

Private Sector Participants

- The ROE is impressive and long overdue. It is refreshing to read something that includes information about progress being made, rather than focusing solely on problems. A lot of money has been spent on environmental protection and hopefully there are some results from the investments.
- The ROE is extremely comprehensive, especially the technical document. It does a good job of balancing the impacts to the environment and human health, with the ultimate goal of understanding the effects of environmental exposures and conditions on humans, balancing improvements with challenges, and acknowledging gaps.
- Energy issues are important and are under-represented. In Introduction Exhibit I-2, "Environmental Protection in Context," the report points out that net energy consumption has increased 40% in 30 years, but it fails to point out that per capita consumption has fallen almost 50% in 30 years.
- Providing more up-front information on the data quality review process would help readers to know that the data are credible. It is important to institute and maintain a rigorous and independent peer review standard for all data in the ROE. Don't lower the standard that has already been set.

Organization of the Report

State Government Participants

- The question format is useful and makes sense to people. It would be good to have a cross-media discussion to help people see things across the somewhat artificial media barriers. Acid rain is an example of an obvious cross-media discussion.
- If this is going to be a public document, it would help to include questions such as, “What can I do to help?” This is needed also because what regulatory agencies can do is often limited.
- The ROE is not structured with questions that ask about specific chemicals, such as mercury or the load of “x” in water that affects quality, and yet there are those (and other) specific indicators—this appears to be a mismatch.
- The ROE would be strengthened with a discussion of how the indicators relate to specific issues and if information on the conditions, status, and trends could be included for each indicator.
- Including a section on emerging issues would make the ROE stronger. EPA could discuss how it is looking to do research on emerging issues.
- The report would be improved by including brief summary tables of the indicators (with their message or data - e.g., a “scorecard.”)
- Including an environmental scorecard or some other short indicator tool would be very helpful to both the public and decision makers.

Academic Participants

- Animal health and related issues, such as population health and mutations, are only mentioned within the context of ecological condition. This is too far down the hierarchy of topics, even though these issues don’t need to be elevated to the level of human health.

Local Government Participants

- EPA could consider including chapter on “working together” that would cover topics such as transportation and recycling, water consumption - where human behavior is the focus and people are working to make improvements.
- The appendices, including acronyms, and glossary were appreciated.
- A “focus group” to help develop the next report would be useful.
- Chapter 6 might be a place to pull together issues such as transportation and recycling - indicators of how people are working together to improve the environment. Energy consumption patterns could be included as well.

Discussion 2: ROE Issues and Questions

Participants were asked to address the following questions.

- Are the right "issues" identified? If not, what should they be?
- Are the questions appropriate for the issues? If not, what should they be?
- Are there specific gaps in the chapters?

Issues

State Government Participants

- The ROE would be improved by including a section on where we need to go from here. We know that we need to make changes in the way we collect and analyze data, and the ROE could be a driver that helps us determine how to do this.
- EPA should ensure that the data are not biased and be up-front about biases where they exist, such as complaint-driven data. It is not clear to the reader that the EPA has done this with the ROE.
- Given that other agencies are also working on indicators, it would minimize confusion if a table or appendix were provided that identified the different parties working on indicators and outlined what collaboration is taking place—or could be possible.
- The ROE seems in general to be lacking indicators. For many of the questions, there are no corresponding indicators or very few and insufficient indicators.
- Sustainability and the health of forests, lands, activities, etc. (as they relate to our human needs) may not be easily quantified but are very important and are not sufficiently covered in the ROE.
- It would help if information on emerging issues such as pharmaceuticals and hormones in water supplies and nanotechnology were provided.
- For the next report, EPA should make an effort, through focus groups or another mechanism, to ask “what do people really want to know?”
- The questions on the health status and trends imply a linkage between ambient environmental conditions and specific health conditions simply because they are included in the ROE. But very few definitive environment/health linkages can be made right now. This needs to be very clear in the report, because in a table or simplified form, people can take it out of context and make causal linkages for which there is no real evidence.
- Including performance that is tied to the budget would strengthen the report, but EPA would have to include this only for issues over which it has responsibility/authority and some measure of control.
- In general, more information on pollution prevention efforts and successes would be helpful.
- International issues (e.g., the Border 21 Initiative) should be included. There are environmental issues on both sides of the U.S.- Mexico border.

Academic Participants

- The ROE should mention the relevant work of other organizations, such as health agencies (in addition to CDC, which is mentioned).

- The health standard data are problematic. You could have several days per year where the standard is moderately exceeded, and that would not be a significant problem, but hitting one day when the standard is significantly exceeded would be a real problem. Therefore, indicators that just focus on “number of days exceeded,” etc., can be very misleading. There is also an argument for just providing the data on ambient conditions, which are what the health effects, standards-based or not, are relying on. It is simply important to ask why there is a standard in the first place and then decide on what data to include. Given that standards don’t capture individual responses and total loads with other pollutants, it would be better to simply include information on pollutant levels so that the scientists can make their own comparisons and draw more scientifically-based conclusions.
- The ROE talks in the preface about what EPA knows and does not know, but a deeper exploration of the “unknown unknowns” should be included.
- EPA understandably did not go out to develop new data sets for ROE indicators. In the bigger picture, if new data gathering systems were to be instituted, it would be good if the systems were more health-based and less regulatory-based. If air quality standards are based on health effects - then there is a need to monitor for health effects not ambient conditions.

Local Government Participants

- The ROE should include a discussion on emerging issues.
- The ROE should include information on human contributions and influences, such as amount of miles driven by each person, commute distances, percentage of population using alternative forms of transportation, etc.
- The ROE should include benchmarks against other countries.
- Reading the ROE led to concern about whether a lot of “spin” had gone into the report. There seemed to be too many positives and not enough discussion on issues that are not being addressed (regardless of whether the issues related to data gaps).
- Within every issue there should be a discussion on “how does this affect the economy?”

Not-for-Profit Participants

- The ROE should provide a definition of “sustainability” that will explain how we can keep what we have today (e.g., from the perspective of land and water protection), recognizing that the bar will be different from one state to another.
- Many issues are subjective, including questions as basic as "what is fresh air?"

Questions

State Government Participants

- A good question in the air chapter would be on the effects of transportation on air quality. There may be four or five metrics that could answer this question.
- Additional questions on the extent of pollution and the greatest environmental risks to the

populations in major subject area would make the ROE a stronger report.

- The ROE should ask questions such as, “what are the greatest risks, and what can I do to reduce my risks?”
- A better explanation of where the questions came from would be useful.

Gaps in specific chapters/questions

Air

State Government Participants

- The questions on air quality standards should include a next level of detail with questions and indicators on state and regional standards.
- Including information on the effects of wildfires and other natural disasters on air quality, the environment in general, and human health would be helpful.

Private Sector Participants

- Cross-border information on issues such as mercury deposition from the jetstream (estimated to be 40% of total mercury load in ten years) should be included.

Water

State Government Participants

- The omission of the state water quality monitoring data is alarming. The states do a lot of work in this area and there should be a plan for making the state data usable for indicators.
- The bioassessment storm water monitoring data should be able to be used as an indicator.
- Water supply is important and is not addressed in the ROE.
- Groundwater quality and quantity are not addressed as well as they could be.
- There should be more information about coastal environmental quality, wetlands, and non-point source pollution.

Local Government Participants

- Include a question such as “What is the condition of coastal waters?”

Private Sector Participants

- Although eutrophication and anoxic zone in Gulf of Mexico were mentioned in the ROE, there should be an indicator on the sources of nitrogen, not just the level of nitrogen. The ROE should also include a discussion of point sources versus non-point sources, which are major contributors to the eutrophication problem. At least a discussion on the difficulty of regulating the two and how

hard it is to get to the non-point source data would be helpful.

Land

State Government Participants

- The waste section would be improved if the issues or risk of radiologic exposures and radioactive wastes were included.
- More information on biosolids should be included, such as where a majority of biosolids go, whether there are health risks associated with the use of biosolids, and thinking about "beneficial reuse".
- Information on landfill/disposal site capacity, which factors into land use and related economic issues, should be included in the discussion of waste management.
- The issue of how much farmlands affect water quality is buried in the chapter. The problems are associated not only with CAFOS, but also with runoff , etc.

Local Government Participants

- There should be more information on transportation and buildings.
- There should be questions about whether we are using developed or farm lands well and/or on the condition of farm lands, rather than what is the extent of developed or farm lands.
- Include a separate question on recycling rather than including recycling within the waste management discussion.

Human Health

State Government Participants

- This chapter would be strengthened if air quality issues were more directly tied to health effects.
- Include information on the cost of addressing health problems. If people see how much health care is costing, they will understand that action is needed.

Private Sector Participants

- The human health chapter purports that there is a relationship between human health and exposure to pollutants. While this may be the case, it is important for the report to also include information on the effects of other factors (e.g., nutrition) which in many instances are likely to have a bigger influence on human health. The other factors should not simply be ignored.

Local Government Participants

- Information on the health effects of asbestos exposure should be included.

Ecological Condition

State Government Participants

- The Texas Environmental Resource Stewards Group, an agency consortium with federal and state participation, is looking at rarity and diversity (both of which have standard metrics) as good ecological indicators. Perhaps EPA could use these as future indicators.
- It is unclear what “chemicals” means in the indicator that refers to chemical contamination in urban streams.

Discussion 3: Report Indicator Gaps

Participants were asked to address the following questions:

- What other indicators/data would be useful? (e.g., regional, state, local?)
- How should they be "integrated" with national indicators?
- What are the priority indicators?
- Which are the least important indicators?

Not-for-Profit Participants

- Many of the indicators are “lagging” rather than “leading” indicators. An example of a leading indicator would be an assessment of dollars being expended on waste water treatment plants - this would give you some idea of what water quality might be like in 20 years. Or in the case of air quality - you could assess the future cost of health care due to poor air quality.
- Cumulative effects of pollutants should be considered, as well as natural pollutants such as molds, algae. 93% of particulates are unidentifiable. It is better to report actual numbers than performance against standards.

Specific Indicator Gaps

Air

Local Government Participants

- Other indicators that might be included are: miles driven, commute distances, percentage use of transportation other than cars, emissions from equipment other than cars, urban heat islands, noise levels, night-time light pollution, asbestos

State Government Participants

- The indicators that measure the number of people living in areas with air quality above “x” are problematic because the “x” is tied to the specific regulatory level. The indicators do not reflect the degree of public exposure to poor-quality air or the actual number of people exposed because

the indicator's population is based on the number of people living in non-attainment areas.

- It is unclear what the indicators that relate to the question on concentrations of outdoor air pollutants are based on. The basis (e.g., average or highest) will greatly influence the indicator's results or "message."
- Use of design value could be used as an indicator. It is based on a formulation that EPA has come up with and everyone follows and can be used for comparison purposes.

Academic Participants

- More information and indicators on indoor air (e.g., perhaps on radon and indoor tobacco smoke) should be included—this is a definite gap in the ROE.

Not-for-Profit Participants

- What are the impacts to air quality due to trucks?

Water

State Government Participants

- In Chapter 2, under the discussion on fish and shellfish, there needs to be a recognition that EPA standards are not the same as states. When advisories are used - the standard against which they are measured needs to be identified.

Local Government Participants

- The presence of micro-invertebrates could be used as an indicator.
- Bio-assessments are important indicators.

Academic Participants

- There appears to be no information on MTBE.

Land

State Government Participants

- Even if indicators on important issues such as availability of waste disposal capacity and land application of biosolids are included, EPA needs to be careful about how it defines terms and projects amounts of municipal waste generated versus amounts managed or disposed. Hazardous waste has been defined and tracked more carefully than have other kinds of waste.
- Again, recycling should be a separate indicator and not simply part of waste management.
- There is a gap around information on the amount of waste being shipped/imported-exported

between states and internationally.

Not-for-Profit Participants

- Wetlands should be included in the land discussion: many people associate wetlands more with terrestrial habitats than with water.
- In the land use discussions - developed and farmland are not necessarily negative. Farmland and urban lands may have “best management” practices - and these should be described.

Human Health

State Government Participants

- The NHANES exposure data are not the best data available. Other data sources should be considered and used.

Priority Indicators

State Government Participants

- From a public perspective, indicators that clearly identify health risks are probably most important.
- Indicators that can be tied to real work being done (or that can be done) are the most important.
- Indoor air quality is a priority indicator. (2 comments)
- Indicators on non-point source pollution and ecological effects of land use in coastal waters and wetlands areas (particularly along the gulf coast area) are important.
- Current issues, rather than old/historical ones (e.g. organophosphates, which are still important, but less important), should be prioritized. Also, data on farmland pesticides should be included. The term “chemicals” should include pesticides.
- An offered “top ten” list: (1) climate change - CO₂; (2) climate change - emissions intensity (include something about goals or targets); (3) energy- ties back to air quality, land use, etc.; (4) air - outdoor air, specifically contributors to pollution, such as power plants (but need to point out there are power plants because people want energy); (5) transportation - on-road and off road use (e.g., vehicle miles per capita) and fuel type (which ties back to runoff on roads etc.); (6) water - water quality and river quality, and wastewater (dollars associated with); (7) ecological condition - intensity of forest usage (ties to why we are using the forests and how forests can be managed); (8) biodiversity - top ten percent of threatened species (e.g., mammalian, avian), percent of threatened species; (9) fish consumption - how much fish are we capturing relative to what is considered “overfishing,” fish management relative to consumption; and (10) consumption in general - not sure how this should be measured; perhaps as a percent of GDP or per capita basis.
- Groundwater recharge and geologic hazards are priority issues for some areas of the country.
- The condition of wetlands (e.g., extent and change) should be a priority indicator. Other

important areas include sediment run-off from farms and other land uses (these should be added), chemicals in the landscape (that would include urban as well as agricultural pesticides) and the extent of land used for waste management (which requires at least surface area information).

- A graphically-powerful indicator on population density would put a lot of other issues into context.

Academic Participants

- The most important indicators should be those that are associated with a risk to life. However, the risks to life can be at different scales, such as 5 minutes, 5 years, and 20 years—therefore, the challenge is the pick the right scales to measure and report. Also, quality of life is the “capstone” but is subjective and difficult to measure.

Local Government Participants

- From a public perspective, indicators that people can relate to on a personal level, such as “what has happened to all of the frogs?” would be the most useful.
- Biological integrity is the most important area to focus on, even though obtaining the needed data is a significant challenge. Other important issue areas are watersheds and objective data on toxins in fish tissue (a lot of the existing data have biased samples).
- Need to make sure the important emerging issues are prioritized, rather than simply falling back on the same old measures for which data are available, but the issues themselves may now be overshadowed by more recent developments.
- In looking at these charts, it is alarming that the most important things are missing, such as the health indicators. This stood out the most. In each chapter the ecological and human health effects are essentially missing.
- Priority indicators should be indicators in all different environmental areas, not only those that relate specifically to human health. Also, indicators that speak to the public, such as impaired water bodies, should be prioritized.
- Air and water are the highest priority areas because they can be tied to quality of life. Other important areas include forest fires, ozone, and air pollution (e.g., PM 2.5). Regardless which indicators are chosen, data quality needs to be ensured because some data, such as older TRI data, can not really be trusted.
- Habitat quality and biological indicators should be the highest priority indicators.
- Population growth relative to consumption (on today’s standards) should be included.

Not-for-Profit Participants

- Water quality and land protection (e.g., loss of land in SE Louisiana) for particularly resource use, are the highest priority issues for our constituents. People are also interested in health advisories related to fin and shell fish.
- Biological indicators and habitat quality are important. If you have good water quality, but it’s a concrete ditch - this does not mean there is good ecological condition.

- Solvents in rain, herbicides, neurological issues, and indoor air pollution (e.g., natural gas and home pesticide use) are the most important indicator areas.
- Measures of biological oxygen demand, which determine marine life in lakes and streams, should be prioritized.

Private Sector Participants

- First, prioritize those indicators that can drive performance and can be backed up to the entities that drive the issues/problems in the first place. The indicators need to be able to provide incentive or motivation to those entities that can do something about them. Second, prioritize those indicators for which trend data are available or can be made available: if indicators are flat, it is less likely that action will be taken, but if they are going up or down, action is more likely. Third, prioritize indicators on human consumption: miles driven, cigarettes smoked, oil and gas produced, number of SUV's, average house size, etc.
- Indoor air, habitat (including wetland critical habitat), and fresh water issues (both in terms of critical habitat and water supply) are the most important areas. Regardless of which indicators are prioritized, a short summary document that says whether the environment is better or worse needs to be included—the current document is simply too long.

Tribal Participants

- A priority for more information should be Superfund sites, particularly those that are not being cleaned up or managed. These sites affect a lot of people and the environment.

Discussion 4: Report Use

Alex Wolfe from the EPA Office of the Chief Financial Officer described how the indicators will serve as an important tool in priority setting in the next EPA Strategic Planning cycle (which will begin in 2004 for the 2006 Strategic Plan). For management purposes, it would be beneficial to use the indicators to identify where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past, but this will require establishing a good baseline. Annual planning requires setting annual targets—even a subset of high quality indicators would be a signal of willingness to commit to a set of measures as part of the annual plan and budget.

Kim Nelson explained that there will never be 100 percent alignment between the ROE and the strategic planning efforts because they are different—measures and indicators are going to be used for different purposes. These are overlapping, but not congruent circles. The EPA Strategic Plan, for instance, will not likely include topics such as cancer rates and measures that are from other agencies. Those items that are in the annual plan and budget have to be measurable on an annual basis.

Participants were asked to consider the following questions:

- How have participants used the report?
- How might participants use the report in the future?

General Comments on Use

State Government Participants

- As long as EPA's processes are aligned and the ROE is linked to the other processes, the ROE will help states to identify their role and how everything all fits together.
- Knowing that the ROE will be used as part of the prioritization process at EPA gives the states a "heads up" about the kind of information that EPA will be looking for from states and other sources in the future. This will help the decision making process.
- The ROE will be used more by environmental groups, which will say "well, here's the trend, so what are you doing about it?" than by the public or legislators. The next ROE should focus more on usefulness for the desired audience, whether that be the public, mayors, state agencies, etc.
- The usefulness of the document is unclear. The ROE would be more useful if it had state-level data that could be used for comparisons. How this state will use the document will depend on how EPA prioritizes its program work, which drives most of the state agency work.
- The ROE has already provided a starting point for one state's own indicator initiative. Knowing that EPA is working on indicators is serving as motivation for the state.
- The ROE would be more useful if it were more widely available in a digital format. Making the ROE available in high schools could be very educational for that audience. Others are likely to find it less useful unless they have a direct business interest.
- The ROE will be more useful if it includes something like a one-page scorecard that would be updated on an annual basis and maybe rolled up every five years and says, "here's where we are nationally."

Local Government Participants

- The ROE could be read by the environmental staff, but the other staff would only benefit from a shorter summary piece that does not exist.

Academic Participants

- The ROE is slick looking: it is likely to be cited and plagiarized by the environmental community and others for years. Its usefulness is weakened by the disclaimer that the ROE does not reflect EPA policy.

Private Sector Participants

- The ROE will probably not be used to make internal improvements, even though it is a very good effort summarized by the EPA.
- If the indicators were tied to performance-based planning and solid environmental outcomes, they might be used by private industry.

Not-for-Profit Participants

- The ROE will be useful for annual/biennial reports and meetings, and to put the work of this organization into a bigger context for comparison purposes.

Feedback on the Session

Participants agreed that the session was very helpful, that it provided the “bigger picture” perspective of how major environmental issues can be viewed together and how agencies may be able to work together. The session also provided insights into the challenge of developing indicators and the opportunities that lie ahead for future reports. The City of Dallas, Texas DOT, and Texas Commission on Environmental Quality expressed an interest in pilots and partnerships around indicators.

Participants

Russell Baier, Texas Commission on Environmental Quality
Sam Brush, North Central Texas Council of Governments
Dale Burnett, Texas Structural Pest Control Board
Dr. Ambrose Charles, Texas Department of Agriculture
Bob Currey, University of TX at El Paso
Carlton Dufrechou, Lake Pontchartrain Basin Foundation
David Dyke, Oklahoma Department of Environmental Quality
Fred Fedri, Occidental Chemical Corp.
Jimmy Gibson, Eastern Oklahoma Regional Office, Bureau of Indian Affairs
Dr. Bertie Griffiths, Environmental Health Center, Dallas
Marty Hathorn, Corps of Engineers, Fort Worth District
Linda Haynie, Texas Commission on Environmental Quality
Charles Holloway, Arkansas Department of Environmental Quality
Leah Hubbard, Texas General Land Office
David Hughes, Louisiana Department of Environmental Quality
Ann Irwin, Texas Department of Transportation
Jeff Isler, Texas Structural Pest Control Board
Jill Jordan, City of Dallas
Chris Kaakaty, City of Dallas/Water
Leah Ann Lamb, Utah Department of Environmental Quality
Tracy Leu, City of Dallas
Mike Lyons, Mid Continent Oil and Gas
Fabian Macias, City of Albuquerque
David Miller, City of Dallas
James Mongaras, City of Dallas
Declan O'Cleirigh, Lower Colorado River Authority
Shanon Phillips, Oklahoma Conservation Commission
Dr. William Rea, Environmental Health Center, Dallas
Alfredo Santistevan, City of Albuquerque
Kent Satterlee, Shell Oil Company
Scott Seneca, Oklahoma City

Haily Summerford, City of Ft. Worth
Elizabeth Tarver, Louisiana Department of Environmental Quality
Dawn Banks-Waller, Office of Environmental Information
Gerald Carney, Region 6
Mike Flynn, Office of Environmental Information
Carmen Henning, Region 6
Kim Nelson, Office of Environmental Information
William Rhea, Region 6
Denice Shaw, Office of Research and Development
Larry Starfield, Region 6
Greg Weiler, Region 6
Alex Wolfe, Office of the Chief Financial Officer
Steve Young, Office of Environmental Information
Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
Anna Brooks, Ross & Associates Environmental Consulting, Ltd.

APPENDIX E
U.S. EPA's National Dialogue on the Draft Report on the Environment
EPA Region 9
San Francisco, California
November 18, 2003

MEETING OVERVIEW

Participants, representing a diverse cross-section of sectors and interests in the West, actively engaged with EPA representatives for several hours, providing substantial and constructive comments on the 2003 Draft Report on the Environment. Several common themes emerged during this dialogue including:

- recognition of the magnitude of developing such a report
- lack of clarity on the audience for the document(s)
- “spin” in the Report as represented by chapter titles for example, raising questions about the science and credibility of the document
- concerns that the “quality bar” for data to be included in the document may be too high
- challenges in navigating and retrieving information and messages from the document(s), with a recommendation that the document(s) be web-enabled
- the need to examine wetlands from quality and spatial perspectives rather than just quantity
- the absence of climate change information
- concerns that measuring against standards that are constantly changing creates unreliable indicators.

MEETING SUMMARY

Welcome

Laura Yoshii, Regional Administrator for EPA Region 9, welcomed participants to the Region 9 National Dialogue session on EPA's Draft Report on the Environment (ROE). She stressed the importance of this work.

Kim Nelson, Assistant Administrator, EPA Office of Environmental Information, provided an overview of the ROE, including key findings. She described the purpose of the National Dialogue as a means to solicit feedback from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public on additional information needs, gaps and approaches to filling them, and uses for the ROE, including alignment of indicators with planning and performance. She stated that the audience for the ROE was represented by the people in the room - environmental decision-makers. She pointed out that there are two reports - a “Public Report,” sent in hard copy form to meeting participants, and a Technical Document, provided on a CD. These documents are not the same, but support each other.

Ms. Nelson emphasized that the focus of the ROE is on the present and is not a projection of goals for the future; however, the ROE has influenced EPA's thinking about its strategic goals, reducing them from more

than ten to five, which closely mirrors the chapters in the ROE. She asked participants to help EPA think about the indicators in the document, whether the bar has been set too high in terms of what is included and identification of major gaps. She said that one gap that has been identified already is a discussion about climate change. This was not included in the draft because the various researchers, reviewers, and scientists working on the document could not reach agreement on the language in time for publication. She fully expects this gap to be filled in future documents.

In the following discussions, participants primarily focused their comments on the “Public Report,” with a few participants addressing the Technical Document.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)

Participants were asked to consider the following:

- Overall impression of the document
- Organization of the Report

Overall Impressions

Academic Participants

- An explicit long-term commitment is important to increase the usability of the report. It would make people more likely to depend on and use it.
- Undertaking the development of the ROE clearly was a tremendous and commendable effort.
- It is difficult to understand the indicators without knowing the purpose of the document. It is hard to assess the document without identifying what the document is going to be used for.
- The ROE may be trying to accomplish too much. If it is going to be billed as an objective document, the parts of the document that read like a public relations document need to be changed.
- The chapter titles: Purer Water, Cleaner Air, Better Protected Land imply a “spin” and public relations rather than science. Chapter titles should not state conclusions.
- The report is not self aware of what has been left out and the limits of what these indicators may represent. If the indicators are to be used for management, then there needs to be more discussion of what is left out.
- The QA/QC criteria for indicators may have been set too high and that needs to be examined.
- The way measures are represented is “all over the map.” A more consistent and systematic way of representing the data would increase the usability of the indicators.
- Usability over time would improve if the indicators were consistent (e.g., a comparison of how we are doing in air vs. how are we doing in water). Part of the challenge is that the ROE is wrapped up in EPA’s regulatory framework (e.g., Clean Water Act [CWA], Clean Air Act [CAA]).

State Government Participants

- EPA is to be commended on this effort. The goal of EPA should be to communicate accurate information to the public. Key to this effort is gaining the trust of the public. A technique to earn trust is to peer review the ROE information to legitimize the document
- If the EPA is considering linking the ROE to state, regional, and local efforts, it is important to send the right message and identify the points of collaboration to assure continuity.
- The ROE should strive to remain objective and present a well-balanced picture—both positive and negative environmental and health conditions. There is a concern about perceived “spinning” of indicators to satisfy agendas. This damages the credibility of the document.
- The technical document was easier to read than the public document—the layout was better. It isn’t clear who the audience is and the public document is too difficult for the public to understand. The technical document is the appropriate level for the people at the table.
- There needs to be stronger support to some of the state monitoring programs to improve the availability of information. Certain areas of the document are weak because of unavailable information. EPA should consider standardizing the indicators and encourage the collection of information to allow for efficient and useful aggregating.
- The bar may be set too high - unimpeachable data are not always available, but they are the only data available and should be used.
- The titles of chapters do create a “spin” - which could be avoided if goals were set - such as cleaner air, purer water.
- It is a good idea to marry the ROE effort with the strategic planning effort.
- If this document isn’t going to be updated the word draft should be taken out.
- Some of the indicators feel as if there is deliberate spin. For instance, “the rate of wetland conversion is decreasing.” Why is this portrayed as positive?
- Participant liked the document, enjoyed reading it and did not have a problem understanding the target audience.

Local Government Participants

- The EPA is doing the right thing in publishing a ROE and the effort is laudable. One major concern is that the report deals solely with environmental indicators without links to performance measures (management indicators). Environmental indicators should be linked to goals and targets.
- Grand scale indicators are difficult for policy makers at state and local levels to use.
- EPA is on the right track in trying to keep the ROE just a science document and must make a concerted effort not to make value judgements. Certain parts of the documents do make value judgements (e.g., chapter titles *Purer Air, Cleaner Water*). Purer than what?
- The introduction should indicate that EPA will use the ROE to identify environmental indicators and that EPA goals and objectives are in a different document and linked to indicators.
- This document feels like a one-size-fits-none document. Smaller localities cannot use aggregated data. It seems like an internal EPA document.

Tribal Participants

- The ROE is a good first cut but still needs a lot of work. The report is too glossy, which may also contribute to it feeling like a public relations piece. Resources should be put to filling data gaps rather than color documents.
- The document should continue to be made available both electronically and in hard copy. Many tribes still do not have access to a computer or the Internet.
- This document will help with identifying the information that still needs to be collected to help fill the gaps. This is not a one-way street, partners such as tribes can help.

Federal Government Participants (non-EPA)

- It is important to have the documents peer reviewed.
- A tri-fold handout might be more useful for the public.

Not-for-Profit Participants

- This is a beautiful document and helps readers engage in the issues; however, the short document is daunting and takes a lot of time to read—it is certainly not a draft intended for politicians.
- There is an incredible amount of information in the public document—maybe too much for the public. EPA is trying to do too much in the public document; the discussion of data gaps is important but may not belong in a public document.
- Who is the target audience? Who should it be? It appears to be about an 8th grade level. Ideally, this information should be available to highly educated individuals who shape policy and do science.
- The goal of aggregated data is good—data should flow from the bottom up. At some point, communication to the folks at “lower levels” will be important so things can be added up nationally.
- It is difficult to navigate through the public document. It is okay to have a document that is large if you can pinpoint where you can get information. The technical document is better at allowing navigation through the document. Sometimes it isn’t clear what the examples are in the public document.

Private Sector Participants

- The report was good, but needs to be condensed.
- The titles appear to mean the ultimate goal. They are not “spin.” (2 comments)
- The discussion of what is meant by indicators should be strengthened. For example, air quality standards should be the indicators and there are similar values for other aspects of the environment such as water.
- The discussion of limitations was very good. This should include strengths and weaknesses of the indicators.
- If the report is for the people in the room, does EPA consider these people to be its communicators

to the public?

Organization of the Report

State Government Participants

- Contextual indicators at the beginning of each chapter would be useful as well as what the causes are, and “so what” statements at the end (pressure, state, response). It would also be good to weave this with what folks are hearing in the news.
- The document is too broad in what it is trying to cover. The Human Health and Ecological Condition chapters should be omitted until they can be completed to the same extent as the Air, Water, and Land chapters. The Human Health chapter should be included once the gulf between environmental information and human health is bridged.
- The EPA should not shorten the document—the more information the better—it is a freedom of information issue. From a health perspective, indoor air quality should be included in the ROE.
- The ROE doesn’t do a good job of integrating the human health chapter. The human health chapter has a good introduction—linking human health and the environment—then goes on to discuss infectious disease. A way to make it more current and integrated would be to talk about environmental outcomes and health together. The chapter feels like it was simply added on.

Academic Participants

- The hierarchy of indicators doesn’t work. Administrative actions should not be the connection to stressors.
- The Health Chapter doesn’t flow with the report—it feels as if it was stapled to the document after it was completed.
- The report should move beyond regulatory measures to develop a more holistic way to look at things.
- The Technical Document is not deep enough. It should note what was missing or issues for which data do not exist.
- Sparse data can be used with caveats.
- The report should talk about what we could be doing to improve things.

Local Government Participants

- The document could benefit from an emerging issues/future section in each chapter.

Federal Government Participants (non-EPA)

- It is very valuable to have two documents (public and technical document).

Not-for-Profit Participants

- The executive summary is useful. The graphics in the public document are excellent but the public document should be shorter.
- EPA could consider making the chapter titles goals (e.g., purer water).
- The public document must clarify what an indicator is and what it is used for. Additionally, it lists limitations for the indicators but doesn't talk about the strengths and weaknesses of the indicators. Some individuals could take the indicators and make policy decisions without knowing the implications.
- The beginning of each section should have key points and a key points summary at the end.
- Key findings would be useful.

Private Sector Participants

- Each chapter in the ROE should have a "news you can use" section. This section would contain information about "what does this mean to me and what can I do after I've read it." This is the type of information needed for the public.
- Information was scattered throughout the document. It was easy to take one data point and then miss the mitigating point that occurred elsewhere. The trends should be summarized somewhere.
- There should be more discussion about limitations in each chapter.

Tribal Participants

- The flow of the chapters is good, sort of an evolutionary process.

Discussion 2: ROE Issues and Questions

Participants were asked to address the following questions.

- Are the right "issues" identified? If not, what should they be?
- Are the questions appropriate for the issues? If not – what should they be?
- Are there specific gaps in the chapters?

Issues

- Information on environmental justice (e.g., exposure levels for sensitive populations) appears to be minimal or, in some areas, missing. This information should be included in future reports. (2 comments)
- Cumulative impacts are not discussed in the ROE.
- The ROE should include a discussion on coral reef systems.
- There is no discussion of loss of species.
- Transboundary issues, such as with Mexico, are missing from the ROE.

- There should be more international data.
- The report doesn't talk about occupational health—maybe that is OSHA but it is still important.
- One participant suggested that indoor air does not seem like an issue EPA should deal with. Another participant noted that it was important for EPA to consider indoor air.
- Outdoor air quality due to smoke (fires) should be included. This affects some parts of the country (e.g., the west, California) more than others. Smoke should be linked to chronic diseases such as asthma.
- An overall concern is that many of the issues and questions are tied up in regulatory approaches to the environment. This means that metrics change - and are unstable over time. Comparable and stable measures should be developed. In the health surveillance arena - the best data go back 30 years.

Questions

- The ROE doesn't have questions that might address rural areas—most questions are geared towards urbanized areas.
- It would be useful to link the questions with the hierarchy of indicators.
- Maybe the point is not to ask the questions at the national level, but to focus on developing prototype regional level studies to see if it is possible to answer the questions that are posed.

Gaps in specific chapters/issues

Air – Climate Change

- The omission of climate change in this document damages its credibility.
- Climate change is an important issue and there should be a question on it reserved in the ROE. An environmental indicator is a scientific measurement of a trend and it would be good to include an indicator trend, such as global temperature information and greenhouse gas emissions. NOAA can provide these data. Another climate change indicator could be water runoff/snowmelt numbers. These numbers should be presented as objective measures/indicators, they are not political numbers.
- Another way of depicting climate change information without labeling things as greenhouse gases would be to label them as gases coming from motor vehicles.
- The ROE should contain raw information that may be relevant to climate change. For example, it could include information about glacial loss and show a chart of glacial levels in National Parks.

Air – Other Gaps

- It is difficult to understand how indoor air quality can be talked about at a national level.
- One gap was the exclusion of outdoor air quality information for rural areas.

Water

- The regulated definition of wetlands keeps changing, but that does not mean that wetland functionality changes. How will EPA deal with these differences over time? There should be some way to regularly assess gross numbers and quality. (There is an example in California, where

wetlands were restored with increased water flows as part of the CalFed project, but they were saturated with mercury - so there are more wetlands, but they are not useful for some purposes.)

- Quality has to be discussed when discussing quantity of wetlands.
- The size of the wetland could be easier to capture as an indicator than quality (e.g., the number of large wetlands are decreasing). Small wetlands and large wetlands play different roles. It would be difficult to do something at a more national level about wetlands quality. The U.S. Fish and Wildlife Service wetlands data is poor and should be qualified in the report.
- Capturing useful information about wetlands is difficult at state and national levels. A surrogate indicator, such as the presence of rare species to wetlands, should be considered. There are not a lot of surrogates out there that are part of a legitimate data gathering system.

Land

- The section looking at pesticide use is incomplete in that it only looks at agriculture data and not at pesticides used in urban areas. (There is an EPA study that shows much higher use of urban than agricultural pesticides.)
- There is no discussion of pesticides in the summary and no breakdown on the types of pesticides considered (e.g., respiratory oxidants).
- Contaminated lands are a huge issue. The Superfund Program is going broke and there is no hint of danger ahead in the report.
- The food issue seems mixed up with the land issue—but it doesn't make sense. Pesticide exposure isn't from dirt but in food.
- Consider including an additional chapter devoted strictly to food—this discussion does not belong in the land chapter.

Human Health

- The ROE does not discuss neurological disorders, which would be an appropriate part of this document.
- The cross-link between human health and other chapters seems to be missing completely. For instance, the mercury in air ends up in fish, which are consumed by humans (and other animals).
- To add to the usefulness of the report, the relationship between environmental factors and human health could be further developed. Mortality is a function of health care, not the environment. Childhood cancer deaths are not due to the environment.
- There is no discussion in the human health chapter about time frames and the relationship to indicators. For instance, exposure to carcinogens and latency periods are not discussed. This would be important to managers and policy makers.
- There is an animal cancer registry at Georgetown University. It is interesting because animals don't have lifestyle factors that influence the cancer rate. This may be something that should be included in the ROE.

Ecological Condition

- The separation of water, wetlands, and ecological condition was difficult to understand. Ecological conditions are complex and interrelated with the other chapters. There isn't a lot of information in

the Ecological Condition chapter. An option would be to create stories such as about cumulative impacts that link water, ecological conditions, and wetlands.

- The discussion about farmland ecosystems is “weird.” This feels like too much of an anthropogenic focus rather than an ecological discussion.
- The natural disturbance piece is difficult to read and understand. Is a northeast ice storm a “natural disturbance?”
- The spatial aspect of stressors should be brought out more. An option would be to create a regional matrix describing the spatial extent of data availability. This would be useful for investments and priority setting.
- The EPA should consider consulting with the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) about “properly functioning conditions.”
- Climate change could be added to the natural disturbance section.
- There has been a lot of work done on phytoplankton that isn't included (see Chesapeake Bay studies).
- The biotic condition discussion seems like a random list. The ROE should look at things in a hierarchy using taxa as a guide. Look at what can and can't be measured based on data availability.
- In the natural disturbance section it would be possible to discuss different compounding variables. For example, the Landers earthquake triggered an outbreak of Valley Fever. Windstorms raising dust in Southern California can affect health in Las Vegas. This involves meteorologists and biologists working together.
- Natural disturbances should include invasive species.
- Ecological footprinting is an approach that EPA might consider in developing indicators.

Discussion 3: Report Indicators and Gaps

Participants were asked to address the following questions:

- What other indicators/data would be useful? (e.g., regional, state, local?)
- How should they be "integrated" with National indicators?
- What are the priority indicators?
- Which are the least important indicators?

General Indicators and Gaps

- A potential outcome from the ROE would be to bring standardization to the collection of local/state level monitoring data.
- In the cases where an information gap exists because the available data did not meet the QA/QC threshold, EPA should consider including that information and appropriately caveating the indicator. Perhaps the QA/QC was too stringent.
- The next draft of the ROE could try to link the condition indicators to the pressure indicators. Show condition indicators and then discuss pressures to explain the conditions. A quote from Jim Karr is:

“Don’t pick an indicator to show something that you can’t do anything about.”

- It would be useful in the next ROE to provide the agreed-upon screening and prioritization mechanisms for indicators.
- For utility when setting the bar for indicator inclusion, it would be useful to know what was lost because of lack of confidence in the data (or because the data said something EPA did not want to hear). Another option is to include most data but have a data rating -- how confident are we in the data — see the AP42 emission factor data rating as a model.
(<http://www.epa.gov/ttn/chief/ap42/>)
- Invasive species are missing.

Air

- At times, the aggregation of data did not make sense. For instance, the six criteria pollutants were aggregated but it would have been preferable to see trend lines for each.
- There is a good discussion of the effects of fine particles and there is now a link of heart attacks with fine particles. Ultra-fine particles is a missing indicator.
- There could be a discussion of what human health effects are influenced by indoor air. For indoor air, it isn't clear if the number is estimated or actually a death-response (Radon). This number should have some qualification—there is more clarification needed on this issue.
- Is it possible to be more specific about the visibility indicator (National Park or city)? Many readers wouldn't know what a Class 1 Monitoring Site is.
- It would be useful to see the raw values of concentration and the standard deviations of the concentration values. This could also aid in credibility—you could simply add the raw information without interpretation.
- “Vehicle Miles Traveled” is an indicator that is missing.

Water

- The wetlands indicators aren't specific enough to document the issues affecting wetlands—they only measure degradation.
- When discussing acid rain, there should be mention of the acid rain impact on impaired water bodies.
- In Arizona, there may not be a single tribal water system that is represented in the current data.
- In the section describing hydrology, there is a gap in discussing total flow. A possible indicator could be early flow by year type (e.g., dry year). High and low flows discussion isn't enough.
- Consider an indicator such as investments being made in sewage treatment plants that then prevent pollution. (Dollars are not being made available to 2/3 of the plants in Chesapeake Bay and they are not functioning properly.)
- Expand the coverage of coastal waters (Alaska, Hawaii, and offshore) and consider the land based sources of pollution and their effect on receiving waters (e.g., coral reefs).

Land

- The chemical data listed in the landscape section rely only on TRI data—the shortcomings of TRI data must be discussed (e.g., self-reporting, the unknown chemicals, and the TOSCA limitations).

- The chemicals in the landscape section would benefit from additional context. For instance, how many new chemicals have been introduced and what chemicals haven't been considered?
- There may be areas where forest data can be updated—timber harvesting is down but there are new data emerging about fuel management and the urban/rural interface. Many private and non-profit agencies will be mapping this interface and EPA will receive this information. EPA could “teach” these entities how to compile the data to begin to fill gaps. .
- The graphic on pgs. 5–13 makes it seem as if erosion stops at the border of Texas. The ROE should discuss the data gap impact on certain graphics.
- Carbon storage should be an indicator in the forest section.
- The land section may benefit from discussing invasive species and linking that with commercial value (e.g., the presence of tea grass affects how many cattle can graze per acre).
- The cost of coastal erosion would be a useful indicator in the Land chapter.

Human Health

- The chosen indicators in the Human Health chapter seem to spin the information. Why are half of the indicators about infectious diseases? The focus should be on chronic diseases.
- Death rates are not a useful indicator—there are too many spurious effects such as access to care, treatment, screening, etc. Details about specific cancers (e.g., breast, testicular) and their connection to the environment would be better.
- PBT’s should be considered a human health indicator.
- The report should address issues that average people are exposed to and should present data as actual numbers with the implications described. This would be better than saying “meets standards.” For example, with drinking water standards, there may be health risks for some people even with current standards.

Ecological Condition

- The biotic indicators (reference 5-4 on page 5-7) reference information from the Heinz report. Referencing the source would be better.
- The ROE could have indicators that separate land and water flora and fauna. Both have their unique set of concerns. NatureServe is putting together a nationwide vegetation program, focusing on mapping plant communities. NatureServe may have other indicators that would be useful.
- Monitoring spending on coastal erosion would be a good indicator.
- Invasive species should be part of an indexed negative indicator.
- The rate of specific loss might be considered.

Priority Indicators

- The human health and environmental indicator linkage should be the most important. The idea of environmental effect on human health drives the regulations.
- Ecological condition is the most important. There is potential to measure ecosystem and human

health. It is also important to have climate change in the ROE—when there are impacts that are driving global factors they need to be included.

- It is important to monitor the entire spectrum of biota (e.g., tropical diseases appearing at higher latitudes). Climate change is also very important.
- The most important thing to include is climate change. This isn't something that would be reported in a state level report, yet it has significance for the state. It has to be somewhere and everybody wants to see a dialogue about climate change.
- The strength of the report is in the EPA charter—that is where the information comes from. EPA could consider scaling back the report and only covering what EPA is responsible for. EPA could work with other agencies to help interpret and report what they do.
- The most important priority should be to discuss rural areas in this document.
- Create the larger picture of climate change and other environmental conditions. (If EPA does not do this, who will?)
- The increasing shortages of quality fresh water are of concern.
- Indices of urbanization and land cover are fundamental in creating a context and must be included. It is the human footprint that is having the anthropogenic effects being discussed. Extent of impervious coverage is important.
- The most important piece is information about coastal issues (e.g., land pollution effect on receding water and coral degradation).
- The ecosystem indicators are the key to the future. These should not necessarily be discrete indicators, but more holistic indices. EPA needs to partner with other federal agencies (USFS, BLM, and NRCS as examples) to measure ecological condition.
- All topics are important (2 comments).

Least Important Indicators

- Multiple participants indicated that nothing is a lower priority and nothing should be removed.
- The chemical section in ecological condition was difficult to understand and in its current form does not contribute to the document. If there were another way of describing this it would probably be useful.
- The natural disturbance section did not communicate anything. It is not obvious what role this has in the ROE. On the other hand, it is worth exploring the link between anthropogenic effects and management strategies (e.g., the Southern California fires, pine beetle infestation, lack of management, air quality, etc).
- The section on diseases felt out of place and unless the ROE can draw connections with environmental causes it should be a secondary priority.

Discussion 4: Report Use

Alex Wolfe from the EPA Office of the Chief Financial Officer described how the indicators will serve as an important tool in priority setting in the next EPA Strategic Planning cycle (which will begin in 2004 for the 2006 Strategic Plan). For management purposes, it would be beneficial to use the indicators to identify

where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past, but this will require establishing a good baseline. Annual planning requires setting annual targets—even a subset of high quality indicators would be a signal of willingness to commit to a set of measures as part of the annual plan and budget.

Kim Nelson explained that there will never be 100 percent alignment between the ROE and the strategic planning efforts because they are different—measures and indicators are going to be used for different purposes. These are overlapping, but not congruent circles. The EPA Strategic Plan, for instance, will not likely include topics such as cancer rates and measures that are from other agencies. Those items that are in the annual plan and budget have to be measurable on an annual basis.

Laura Yoshii pointed out that the document(s) provide a way to develop a shared understanding of issues and interests in indicators at the regional level. This understanding will help to develop the ability to drill down into the data for more details. Right now, regional strategic planning is a separate process, but there are efforts to change this. The ROE would be used to provide context that would lead to strategies and actions to address the goals to accomplish the outcomes, which could then be measured in future ROE's.

Participants were asked to consider the following questions:

- How have participants used the report?
- How might participants use the report in the future?

General Comments on Use

- The EPA strategic plan indicates that climate change is a priority. What kind of marriage will that be with the strategic plan mentioning climate change and the ROE not having climate change information?
- It would be good to compare indicator efforts at different levels (e.g., EPA, California, Hawaii). There should be some effort to work toward convergence. Collective decisions should be made on the best way to collect and measure things. This document should fit logically with the strategic planning efforts at multiple scales.
- Many participants agreed that a web and a print version of the document should be made available. The web version would be especially useful if it had links to primary sources of information. A web version would make searching much easier.
- It would be useful to see national level indicators that can be compared with indicators from other countries. Other countries have done good work with indicators and it should be researched.
- A series of brochures by chapter would be useful. This would make it shorter and more digestible for public consumption. These could address issues of importance to different audiences - e.g., city council, planning commissioners. (Sound-bite size pieces)
- It would be useful for EPA to develop some model standards for indicators that could be used locally. Data could be aggregatable nationally. The Federal Geographic Data Committee metadata standard could be used to document quality. This would be valuable for developing partnerships and indices. The questions that should guide the indicators are: How do we know if what we are doing has real outcomes? Are we making a difference in the environment?
- EPA could use the ROE to target money and priorities to improve data creation and gathering.

- Where data are missing, can the ROE prioritize the elements to give report users ideas on where they can collect/provide information to help address the gaps?
- The concept of stewardship is important. How do we care for the environment? It would be useful in a future version to have a chapter on what can be done with the information in the report.
- EPA is doing the right thing. Ideally you go through a process that helps to identify what's important and how to mitigate impacts. These then feed into the strategic planning process. In reality, this usually happens in parallel.
- This document provides value at the local level as a statistical resource.
- The potential for sharing this information is important, especially for the educational community. Everything should be available on the web with links to the primary data sources. It is a good document for junior high and high school students.
- The report has to be on the web and linked to primary data sources to be useful. Hard copies could be available by request.
- A three-to-five year cycle for publication is good. If published more frequently, trends will be harder to see.
- Producing the report every two years would be useful.
- The appropriate time frame is five years. There should be at least a few years in between versions to be able to see changes.
- This document is important to provide context and also identify what information is missing and what needs to be addressed.
- The importance of this document is at the federal level. The United States Congress needs to see this information. Use the ROE for prioritization, budgeting, performance measures, and accountability. The report is not useful at the county or city level. State legislators may find the report useful.
- The ROE is wonderful background information and is useful for students.
- EPA should create a separate product for high schools. Someone should translate the information so it can be used for high school education classes.
- The report can be used by other federal agencies as a barometer for research
- Must emphasize the availability of this document at different levels. There seems to be a gulf between individual responsibility, with a tendency to be insular, without knowing how personal decisions locally affect local and national issues. Local governments need to be aware of the information. You can make them use it but you have to translate it for them.
- The fact that there are no state/regional breakdowns is a good thing - reminds readers that they are citizens of the U.S., it provides an uncommon frame of reference.

Feedback on the Session

- In the spirit of increasing credibility, participation from a broad range of scientists should be encouraged.
- Stakeholders should be involved to help establish goals.
- EPA should resist, to the extent possible, political pressures and remain objective. There is a lot

of information in the ROE that could be “word smithed” to remove the spin. Being conscious of how the document will come across is in the best interest of EPA. Aspects of this report feel like the Administration is biased. The team working on the Environmental Protection Indicators for California (EPIC) report became responsible for the scientific truth (see <http://www.oehha.ca.gov/multimedia/epic/aboutepic.html>) .

- Somehow what we are tracking needs to be connected with planning and performance.
- It is important to be able to understand the graphics and text from the report and be able to extract them from the document.
- It might be a good idea to give a short written survey to users on how to improve report usability.
- Many environmental degradations are a result of our life-styles. There is a need to make these connections and communicate this message. We have more urban sprawl than 20 years ago....how do we change this?
- EPA should be talking about sustainable communities.
- It would be great to receive a participants list with contact information. The participation has been very satisfying.

Public Comment

Sarah Newman, Ansje Miller, and Jim Nikas gave public comment.

Ansje Miller from Redefining Progress read from a prepared statement and stressed the need to include climate change in the document. Additionally she felt it was important that subsequent documents address environmental justice. The national dialogue sessions could have had better attendance but there is a feeling that individuals would not be heard. The ROE could lend itself to be spinproof by marrying it to unbiased indicators and the Ecological Footprint effort.

Sarah Newman from California Interfaith Power and Light read from a prepared statement on behalf of her organization. California Interfaith Power and Light is a statewide interfaith global warming campaign working with clergy of all faiths, united in their common concern for this impending environmental catastrophe. We urge the Bush Administration to include global warming in its Draft Report on the Environment. It will send a message to not only religious leaders but to people of all faiths around the world that our nation is concerned about global warming.

Jim Nikas representing the Regeneration Project, said that his organization is religious response to global warming. The Regeneration Project constitutes 680 congregations and churches of various denominations—240,000 people in total. Creation is being threatened, no matter how you slice it. He urges and demands that EPA includes climate change in the ROE. As it stands, the ROE provides the people with a picture that is incomplete. He thanked participants for being present, knowing it means that they care about the planet.

Participants

Daniel Chang, Civil & Env. Engineering Dept, UC Davis
Amy Kyle, School of Public Health, UC Berkeley
Alan Mikuni, USGS
Paul Martin, Western United Dairymen
Brian Johnson, City of Santa Monica
Rick Harter, L.A./San Gabriel Rivers Watershed Council
Cathy Messerschmitt, North Fork Rancheria
Jim Nikas, The Regeneration Project / The Presidio
Patrick Gibbons, AZ DEP
Linda Mazur, Cal EPA
Fred Castro, Guam EPA
Dave Emme, NV DCNR
Ed Skudlarek, NV DCNR
Paul English, California Environmental Health Tracking Program, CDHS-EHIB
Steve Arita, Western States Petroleum Association
Holly Welles, Pacific Gas & Electric
Sarah Newman, Interfaith Power
Ansje Miller, Redefining Progress
Laura Gentile, EPA Region 9
Kim Nelson, EPA CIO / OEI
Alex Wolfe, EPA OCFO
Mike Flynn, EPA OEI
Laura Yoshii, EPA Region 9
Nora McGee, EPA Region 9
Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
Rob Willis, Ross & Associates Environmental Consulting, Ltd.

APPENDIX F
U.S. EPA's National Dialogue on the Draft Report on the Environment (ROE)
EPA Region 10
Seattle, Washington
November 20, 2003

MEETING OVERVIEW

Participants, representing a diverse cross-section of sectors and interests in the Northwest, actively engaged with EPA representatives for several hours, providing substantial and constructive comments on the 2003 Draft Report on the Environment. Several common themes emerged during this dialogue including:

- the importance and value of publishing such a report
- lack of clarity on the audience for the document
- a tendency to state things positively and overlook negative environmental trends
- the need to provide access to the ROE in a web format
- a strong sentiment that more information should be included on the marine environment and oceans
- the absence of climate change information undermines the credibility and usability of the entire document.

MEETING SUMMARY

Welcome

Ron Kreizenbeck, Deputy Regional Administrator, EPA Region 10 welcomed participants to Region 10. Ramona Trovato, Deputy Assistant Administrator, EPA Office of Environmental Information provided an overview of the ROE. She described the purpose of the National Dialogue as a means to solicit feedback from federal, state, and local agencies; industry; non-governmental and environmental organizations; academia; and the public on additional information needs, gaps and approaches to filling them. Additionally, EPA would like to receive feedback on uses of the ROE, including alignment of indicators with planning and performance.

Ms. Trovato provided a brief overview of the ROE, indicating that the audience is primarily environmental decision-makers. Development of the document took more than \$1 million and eighteen months of effort. She described the "Hierarchy of Indicators" ranging from administrative to outcome measures and noted that most of the indicators in the ROE fall in the Level 3-5 range, including stressors, ambient conditions, and exposures. Most of the data are derived from EPA, other federal, state, regional, and tribal information sources. Additional data are from The Nature Conservancy (NatureServ) and The H. John Heinz III Center for Science, Economics, and the Environment's *State of the Nation's Ecosystems* report. While the emphasis of the ROE is on the present, not projection of goals for the future, she did note that the ROE has changed EPA's thinking about its strategic goals, reducing them from more than ten to the current five, which closely mirror the chapters in the ROE. Next steps include summarizing

these regional meetings; assessment of gaps; aligning planning and indicators; and developing better indicators that are integrated locally, regionally, and nationally.

In the following discussions, participants focused primarily on the “Public Report” and not the Technical Document.

Discussion 1: Overall Assessment of the ROE (readability, organization, format, etc.)

Participants were asked to consider the following:

- Overall impression of the document
- Organization of the Report

Overall Impressions

Academic Participants

- The ROE is ambitious and the EPA should be commended. The public report was easy to read and well written. More science could be included in the technical document. The public report is too simple for the environmental decision-maker.
- It would be useful to have a similar document at the local level. Aggregating to the national level is frustrating because so much resolution is lost.
- The ROE is a solid first effort and would receive an “A” for effort. The product itself would receive a B- or C+ grade. It is good for a first effort. The ROE does not do enough to document the strengths of state programs, if only because the emphasis is on the national scale. It makes it impossible to document the influence of existing small programs.
- There should be more of an effort to discriminate the critical indicators. A potential approach is to bring 20 ecologists together and ask them to each identify their top ten indicators and then employ a rigorous approach to determine which of the indicators actually provide clear and easily interpreted signals about the condition of places.
- The report is internally inconsistent in the use of terminology, context, and support, e.g., the use of pollution vs. pollutant - pollution is overarching while pollutants are a component of pollution (as defined in the Clean Water Act). Environment, ecological condition, and ecological health are used interchangeably.
- The ROE reads like a book with different authors for every chapter - without consistent editing.

Federal Government Participants (Non-EPA)

- The EPA should emphasize that the ROE is a snapshot and offers a broad brush of information. This process and document are exciting. Quite often people in the field don't know the bigger picture-- is the battle being won? In the field you are part of a bigger thing and being able to see the bigger picture is important and the ROE can be used to accomplish this.
- The EPA should keep producing the ROE to assist in identifying trends. Trends at the local level

are a critical decision making tool but the report would have to have more granularity to be useful. The ROE will become more useful as the information becomes further refined.

Private Sector Participants

- The EPA must do more outreach, nobody has heard of the ROE effort. The document is very “sexy.” It read very much as a primer and it would be depressing if the general public couldn't read the ROE.
- The ROE effort is applauded and the EPA must keep putting this document out. It is EPA's job to provide the “50,000 feet” view. Oregon has been using benchmarks for years and it is impressive it only took EPA 33 years.
- The information was a bit disjointed so it was difficult to get information from the ROE.
- Overall, the ROE is professional and well written, however, how will it ultimately be used? The important piece is going to be to make the ties between the high level and the local scale. It is not clear how the ROE is going to do this.
- Individuals in a position to use the ROE to make policy decisions must be assured the information in the ROE can be trusted. It is great that EPA put out a Report on the Environment but policy makers need to know about the omissions. How did the EPA determine what stories to tell? Once the report user has the smallest bit of doubt it leads to more doubt. The more the report can just be the data the more it can be useful, especially if users can get to the primary data.

Local Government Participants

- This report was well written, readable, and the graphics worked well. The ROE sets a national benchmark and that is good. The document overall is an excellent primer to those who don't know environmental history. The scope and breadth are appropriate for a national level report. Using questions as the approach is the strongest part of the ROE.
- The case studies contribute significantly to the readability and comprehension of the ROE.

Not-for-Profit Participants

- It would have been nice to have the opportunity to comment on the draft before EPA put the current draft out. It is odd to comment on such a beautiful “finished” document.
- The ROE is a good idea.
- The ROE is too high level. It was difficult to find context and unclear how the ROE will be useful at the state level. The ROE led to many more questions without answers -- it read into a big hole.
- The intended use of the report is unclear. The ROE is a curious combination of general information and vignettes of specific information. It is unclear who would read the ROE.
- There must be subsequent ROEs. EPA should commit to a ROE on an annual basis and the current ROE is a good start. In ten years, the ROE might start picking up some trends and it will become more useful. CEQ used to publish a report and some of those reports were excellent in

identifying emerging issues. The ROE should consider the model of the CEQ reports. The CEQ documents had a pattern that tried to look at status and trends, they identified emerging issues, and tried to prompt federal action. An option for the ROE is to create it annually, but shift the spotlight each year.

- The ROE was readable and enjoyable (It almost read as an almanac). Young folks could read the ROE and get excited. In a way, the ROE is conservative, you won't read the Report and say, "I want/need to change my behavior." The report does a good job of capturing the pretty truths, but it is very conservative, does not want to "ruffle feathers." What is missing are the ugly truths. For instance, on the ground, at the local level, the air might not be getting better (at the national level it is). Nevertheless, it is a good idea to create and publish the ROE, perhaps correlated with new Census data every ten years - for better demographic, and socio-economic reporting.
- A broad concern is that this is an incredible opportunity for EPA to reach out, but the word about this document has not gotten out. The Pew Oceans Report involved much of the science community nationwide. This report could do the same, but requires more media attention.
- The positive tone goes too far. The majority of the graphs that show any decline have a footnote that says something like: "this is due to increases in monitoring." The unwillingness to say anything negative undermines the report.
- There is an emphatic need for a National Dialogue meeting in the Northeast.

State Government Participants

- The EPA should begin thinking about how to create a good and sustainable Federal/State partnership on such a report. EPA's effort is appreciated and it is very important, but state level contributions should not be overlooked.
- This is a pretty, high cost document. An ROE of this caliber is extremely difficult to do at the state level with current budgets. The ROE is well done and very general, the specifics are not there. The ROE should be focused on solutions.
- The report reads as if it has two different purposes, which is not positive - a report on the national environment and EPA's effect on the national environment. This flows from the basic conundrum on the hierarchy of indicators, especially level 2 indicators - which are basically represented as EPA responses. What is missing from the indicators, as part of level 2, is the effect of all unregulated, spontaneous activities. This is missing conceptually, which leads to editorial issues. Is it enforcement or gaps in the law that cause negative environmental effects?. When assigning causality to environmental performance, you cannot identify the cause - instead it is talked about on level 3 indicators. EPA needs to look at the technologies and practices that are leading to the environmental stressors, e.g., increase in nutrients results in eutrophication, leading to hypoxia. In this example, the ROE should have a discussion of the contributors to increased nutrients such as septic systems (40% of nutrients) and agriculture. The ROE does not need a discussion of laws.
- This report should continue and line up with the EPA strategic planning effort. Every two years would be a reasonable time frame for a publication. But the report should also be put on the Web as a living multi-layer document with drill down capability to the primary information. If the ROE would be put on the web, creating the report is simply a harvesting of data. An additional advantage of publishing the document on the web is that it also makes the ROE peer-reviewable.

The next report should not just be a response to gaps, but should consider the use of the web to connect to state issues - helping to build state-federal partnerships.

- The EPA did a great job and are brave souls for doing the ROE. This document should be looked at as a national benchmark. This is first report that tries to set national benchmarks. It is important that the EPA doesn't try to do the work of States but find out where the states can help begin developing the indicators with them. States need to pick it up from here, but the process would benefit from consistency on the way to collect information.
- The ROE effort is great and focusing on environmental results is important. It is not clear what EPA intends the ROE to be used for. Is it to motivate? Is it to be objective? It is difficult to produce a scientifically credible document without pushing an agenda. It is unlikely that this document will be useful at a local level; however it should prove useful for the EPA.
- It is difficult to separate out the performance of programs and actual environmental results. The ROE has trouble doing this.

B. Report Organization

Academic Participants

- This document should be published regularly and have cycles of reporting with emphasis on different topics every year. It is important to do a better job on focusing on what is left out. A potential way of focusing on what is left out is having a section with emerging ideas. The key is not to let emerging issues distract the ROE from capturing its core information.
- Pollutants and media are the organizing framework but Human Health and Ecological Condition chapters should come first. If the goal is human health and environmental health, the ROE should be framed accordingly and the EPA track by these metrics, not by media (Water, Air, Land). EPA has a challenge to stop thinking within its traditional stovepipes.

Federal Government Participants

- It is difficult to put out a ROE at a national level and reduce the complexity to a document for the public. Readers are parochial and like to see what is happening at their own levels. Doing a report at a national level is restricted by looking at it at the lowest common denominator because the local information doesn't lend itself to national aggregation. We thank EPA for putting out this document.

Private Sector Participants

- The ROE is perceived to be a view from 50,000 feet and it does a wonderful job at describing the environment at this level. The ROE should remain at this level, but if more detail is desired, then EPA should provide resources to the states to collect the information. Even with this, the 10,000 foot view won't meet everyone's needs. The EPA should let the states go to the next level.

Local Government Participants

- Outreach about the ROE should include information on what will be done with comments on the report and what the EPA will do with the draft report.
- EPA's regional offices should take the lead on the outreach and providing opportunities for expanded discussion of issues/information in the report as well as future directions.
- As an outreach recommendation the EPA should reach out to the Northeastern United States.

Not-for-Profit Participants

- The ROE is understandable, well done, and the chapter breaks intuitive.
- The ROE was useful, but it was difficult to find the specific information. The web would make information easier to find.
- It would be good to see the ROE as a final report.
- The ROE is a commendable effort. The EPA now has the challenge of communicating science to lay audience. A poor strategy is to take a big report and condense it to a smaller report. A potential approach is to synthesize the information and tell a story to lay audiences. For the public, the story is about the outcomes.
- Reading the ROE from an activist perspective, the ROE is helpful and an admirable effort. The ROE will serve as valuable benchmark that needs to be repeated periodically. When read, a lot of the value of the report is in identifying the gaps of knowledge. What would be useful is to publish the ROE on the web and tie it into state level efforts that then allow the user to drill down to the defining issues at the state level. Generality tends to hide local problems and the public needs access to what is going on at the local level.

State Government Participants

- Not many people are eager to have a hard copy of the report, yet a lot of people would like to go on the web and get the latest information. Put the ROE on the web and keep it a live document; update the information as you have it and maybe have yearly emphasis on one topic.
- It is important to continue this report to see if EPA's long term strategies are working. It is important to be consistent with indicators and acknowledge that not everything is measurable and not measure unmeasurable things.

Tribal Participants

- The EPA American Indian Environmental Office (AIEO) should coordinate with Regional Tribal Offices to produce a State of Indian Country and Tribal Lands report.

Discussion 2: ROE Issues and Questions

Participants were asked to address the following questions.

- A. Are the right "issues" identified? If not, what should they be?
- B. Are the questions appropriate for the issues? If not – what should they be?

Issues

Academic Participants

- We are literally buried with economic reports and this is a report that is supposed to reflect the state of the environment. The ROE should not include economic information. If the EPA decides to include economic information the ROE should make the effort to talk about it in the same way (econometrics) that they are normally addressed.
- This report should not be about whether EPA is doing well regulating activities.

Private Sector Participants

- For some of the long term problem areas that people have been working on for a while, it would be useful for policy makers to know what created the problem. Without this perspective, a “quick read policy person” may read the ROE and put regulation in place that isn't appropriate.
- It is not appropriate to leave information out of the ROE without acknowledging that has been done.
- For industry, a big concern is “funneled regulation.” Without a thorough study of the environmental problems (components) and their corresponding indicators, there is a potential to become narrowly focused on one specific issue, at the expense of another.
- “ ‘Stressors’ is not in my spell check, I didn't realize that I was a stressor. I thought I was a ‘stressee.’ “
- The ROE must spend time exploring the influence of some indicators on other indicators.
- The ROE does not mention the link between the environment and the economy. The EPA needs to be mindful that the two are linked -- one won't surge ahead without the other.

Local Government Participants

- The ROE should provide a better explanation of the need for a national environmental and public health baseline.
- The Next Steps sections should be expanded throughout the report. Generally, the ROE Next Step sections need to present or draw more conclusions and discuss or describe what still needs to be done.
- The ROE should consider including information on obesity; sprawl and urbanization; coastal waters; Alaska, Hawaii, and Puerto Rico; watershed protection.

Not-for-Profit Participants

- There is nothing in the ROE about environmental justice. The EPA may consider waiting for the new census information as it is information germane to this report. It would help if the ROE broke environmental effects down by socioeconomic status.
- The discussion of Oceans is non-existent (even though it is 50% of the US). The small bit of mention ocean receives is not even in the water section. The inclusion of ocean indicators is very important. The U.S. Ocean Commission report has just been released and should be used as a resource.
- A discussion of the coastal ecosystem is missing. The coastal Water Quality section talks only about estuaries and not the coast (where the majority of the population lives). With regard to coastal issues some of the things missing from the document are over-fishing, habitat loss, and habitat degradation.
- In the Ecological Condition chapter, there is discussion of erosion, but there is no discussion of physical processes on the beach.
- Coasts and oceans not being included is a glaring error. The marine ecosystem needs to be added.
- The document should not have omitted climate change. The dialogue here should be about how we represent the results of climate change, not whether it should be represented. We should be talking about the relative roles of advocates and scientists in the climate change dialogue but we cannot have that dialogue because nothing is in the report. There is a difference between an information gap and a political motivation. The basic science of climate change is no longer controversial. It is EPA's responsibility to rise above political motivation and publish the science first. The talk about what to do about it can come later. This is a state of the environment (not linked to outcomes, or what to do), and that gives the EPA license to publish climate change science. EPA doesn't have to be on the front lines.
- The ROE must talk about how the indicators change over time (this could potentially be part of the QA/QC criteria for indicators). Indicators must be sustainable and consistent over time to allow for long term trend information. The bottom line is being able to use indicators for trend analysis and there has to be consensus between states and EPA on what the right indicators are. The process should also acknowledge that you may not be able to identify national indicators in all areas. Finally, the indicator development process should consider that the ecological condition indicators are the end goal and that it takes a substantial effort to get to these.
- The ROE should have information about pollution on military bases to improve credibility.
- The document should note that some issues can be managed and regulated and others cannot. Forest fires can't be regulated.

Federal Government Participants

- For some practices (e.g., forestry) - the market incentives are very big, and the practices are seldom regulated. There is a need to consider how to weave together the regulatory and non-regulatory approaches.

State Government Participants

- Omission of climate change hampers the credibility, especially since climate change also impacts other environmental issues.
- Economics are important and should be mentioned in the ROE. Issues like non-attainment and those types of things have to be mentioned.
- EPA resource allocation should be mentioned in the ROE. How much money is EPA spending on Cleaner Air, or Purer Water?
- A national dialogue would be useful to talk about how to interpret the data. What does healthy biological condition mean? What should the reference condition be? (e.g., pristine conditions?). Without a national dialogue on data interpretation, it's not obvious there is agreement on where the nation needs to go.
- The ROE must talk about invasive species -- in the Pacific Northwest Eurasian milfoil, zebra mussel, and West Nile Virus are increasingly risks.
- The ROE does not discuss what the baseline is for all the data (natural conditions or regulated conditions).
- If the ROE is going to include oceans, it is imperative that the report does not aggregate the data for both oceans. The ROE should treat the Atlantic and Pacific differently.
- There is no information on EPA initiatives; this seems strange in a Report published by the EPA.
- Climate change is missing and the EPA has a responsibility to show the data. There is substantial information available on the softening of the tundra or the melting of the glaciers.
- The EPA should consider including information on international efforts.
- The ROE focuses its water discussion around water quality at the expense of water quantity. The ROE should talk about water quantity. A potential indicator is the extent of aquifer depletion.
- In the Land or Ecological Condition chapter the ROE should include information about the Endangered Species Act (ESA). Useful indicators for the ESA could include trend lines on listings and species at risk.
- In the Land chapter, the ROE should have information on energy use and the sources, and include a category on military base pollution. Another potential important piece of information the EPA should consider adding is the potential for pollution of different transport mechanisms. In the current ROE this is an instance of what we know that isn't emphasized -- the ROE says pollution from different transport mechanisms may or may not cause health effects, but we know it does.
- The ROE/EPA should consider adding projections to the ROE (something forward looking). What are the effects of EPA's decisions on indicators?
- The ROE should talk about transborder issues.

Tribal Participants

- The EPA should spend time on global climate change and our contribution of greenhouse gases.

- Land use changes would be useful to include in this report. It is important that it is coordinated with other indicators reports.
- The ROE should include information on traditional ecological knowledge.
- Alaska and Hawaii should be included in the technical data report.

Questions

Academic Participants

- Graphic 2-6 is a superb figure but the report doesn't catch the importance of the issue -- it doesn't emphasize the negative part of story. All throughout the ROE there is a picking and choosing of how the stories are told. An example is how forests are treated; everything that has trees is treated as one. (Second growth vs. Old Growth) and that is a shortcoming and misleading. The lack of clarity in this type of distinction make it difficult to track the issues. EPA should not be regarded as a regulatory agency but rather a mechanism to protect the public and as such it should try not to frame the ROE around its regulatory business.
- It is important to emphasize and reiterate the point about the life cycle analysis of the indicators. Specifically, in the Air Chapter discussion of quality, the ROE needs to answer, "What are the main contributors to change?"

Private Sector Participants

- The ROE has a missing question, "What has contributed to a given change?" More information needs to be provided about what is contributing to the change in a trend.

Local Government Participants

- Future reports should include, to the extent possible, a three part trend analysis. 1. What has changed over time? 2. What does the change mean, including what the current condition may have looked like without the investments already made. 3. What will the condition look like if we make no further investments?

Not-for-Profit Participants

- If the ROE is going to be a State of the Environment report it cannot be framed from the lens of the EPA's programs. As you move towards a true State of the Environment report the framework must migrate towards the human health and ecosystem level.

State Government Participants

- It is important to be careful about what is measured because what we measure is what we shoot for. (Be careful to set benchmarks) The EPA might consider relating directly to the Clean Water Act (CWA), is the water fishable? Is the water drinkable? Is the water swimmable?

- Coming up with national indicators useful to the general public is very important and it is critical to do right. The ROE seem to place a huge emphasis on where progress has been made vs. where problems still exist. It makes the ROE seem “spun.” To mitigate this, the EPA could decide to include goals. The components of the CWA (tie them to statutory goals) are an example.
- In the Land chapter, the ROE should add soil erosion as a question.

Discussion 3: Report Indicators and Gaps

Participants addressed the following questions:

- A. What other indicators/data would be useful? (e.g., regional, state, local?)
- B. How should they be "integrated" with National indicators?
- C. What are the least important indicators?
- D. Most important or "priority" indicators?

General Indicators and Gaps

Not-for-Profit Participants

- There needs to be a way that the ROE identifies what is important, i.e., a teaspoon of plutonium vs. manure. It would be good to include priority areas needing cleanup. While the aggregate data are important, there is also a need to have the environmental hot spots. A potential indicator of hot spots is looking at the map of where the most activists are and this is a hotspot. This indicator would identify where the environmental issues are and where things are not working.

Tribal Participants

- The ROE is missing discussion on the sustainability of culture. What in the environment sustains a culture? For instance, gaps include - health issues associated with fish consumption and the consumption is different by tribal populations. Another human health impact is recognizing that if tribes don't have native foods to consume, heart disease goes up. The ecological conditions that support (or don't support) the sustainability of culture include the effects from global/micro climate change. For instance, climate change may cause a winter period shortening which affects stream peak flow that affects the survival of salmon which in turn affects the sustainability of culture.

Academic Participants

- All indicators should be identified as to where they fall in the “Hierarchy of Indicators”

Air Chapter Indicators and Gaps

Academic Participants

- The ROE states that NOX emissions are going up and this increase can be attributed to off-road vehicles and diesel vehicles - is this true?
- The air quality index (AQI) unnecessarily aggregates information. The ROE should simply represent the concentration of each of the pollutants. The AQI does not work because, for example, two airsheds could have the same AQI, but in one all six criteria pollutants could be “bad”, while in the other, just one could be causing the degradation and there is no way to tell just looking at the AQI.
- A useful Air Quality measure would be a short-term Air Quality index for PM_{2.5} and PM₁₀.
- The ROE should include Air Quality indicators for smaller cities.

Not-for-Profit Participants

- The AQI does not work for sensitive populations. Children who are sensitive react much quicker than the AQI can help address.
- For ozone, it would be beneficial to know how many people are affected and also how many areas are being affected and the spatial extent.
- The Air Quality index is not useful because it is meaningless to the sensitive populations. There need to be measures/indicators that work for all stakeholders.

State Government Participants

- In the Air Quality section (1-3) the discussion of visibility is a good example of summarized data being potentially misleading. Currently, the EPA or the President are relaxing the air quality standards in National Parks and there is nothing that indicates this is happening. This positive spin may put people to sleep.
- The ROE should include a section on odor.

Private Sector Participants

- Smoke from forest fires is an air quality issue.

Water Chapter Indicators and Gaps

Federal Government Participants

- USDA as a whole has information on outcomes related to clean water.

Not-for-Profit Participants

- In the Water Chapter, the beach closure indicator is flawed (poor indicator). Beach closure information cannot/should not be aggregated, the ROE should look for individual samples for beaches. Also, using lack of sampling is a bad indicator for beach closure -- the ROE has to find out where the water isn't being tested.
- For the fishery section, the ROE needs to cover habitat loss.
- The ROE should include information on coastal health. Potential indicators include: inventory of healthy, natural sandy beaches; loss of sand on beaches; and, extent, degradation, and quality rookery habitat. The PEW Ocean Commission and U.S. Commission on Ocean Policy Final Reports are or about to be issued and the ROE should be deferential to these for the ocean sections.
- The map on estuary health is nice but water clarity is a bogus indicator of estuary health in Puget Sound because clarity simply indicates that plankton are gone (which is not good). As soon as the ROE begins trying to look at ecosystem health it becomes such a complicated picture that indicators at a national level become problematic but the more you go towards ecosystem health the closer you are to a real state of the environment report.
- The ROE should consider using probabilistic water sampling.
- To bolster the gaps in water quality data some of the local information must be integrated. For instance, Oregon has water sampling from 1949.
- The ROE should document that a potential reason for the gaps of information in the Water chapter is due to the fact that the CWA is a state-level implementation. (As opposed to Clean Air Act, for which information is collected consistently nationally, resulting in more complete information for the Air chapter). The ROE should document that Air has national standards and Water does not.
- The Water chapter should have new indicators for water biointegrity - dissolved oxygen, turbidity, fecal contamination, and temperature. For all indicators, wherever possible, the ROE should strive to show the actual data (not the interpreted data) and all caveats.

State Government Participants

- The ROE should begin trying to make linkages between level 2 and higher level indicators. For instance, in Water, there could be a link between nitrate load and stream water load (flow).
- Talking about water quantity in the context of water quality does not give readers a sense of how precious and limited fresh water is. The context should state that fresh water is a very limited resource.

Tribal Participants

- The ROE should include a discussion about water quantity, specifically, the loss of water quantity and the impact of groundwater recovery. The environmental issue is complex and it spans different areas, the runoff is being piped (land cover issue), so that means less water in the river (water quality issue), which leads to higher concentrations of regulated and unregulated pollutants (Water Quality, Human Health).

- The ROE watershed discussion is too focused and isn't looking at the right level. The environmental community needs to figure out how to look at watersheds in a less aggregated way. For instance, watershed alteration because of the removal of old growth may show changes in micro-climate, which affects how the air is cooled. El Nino effects have watershed implications on rain and water and snow patterns. When we concentrate on smaller scale watershed issues (e.g., national water quality) we lose what is happening at the large-scale watershed level.
- Nearshore habitat functions should be included as these are limiting for salmon and shellfish.
- The presence of native vegetation and how it helps to support watersheds is important.
- Cumulative watershed indicators should be included.

Land Chapter Indicators and Gaps

Academic Participants

- The Land chapter feels like an odd Ecological Condition chapter. Ecosystems are changed in different ways - logged, urbanized, grazed, planted and harvested which affect their ability to provide habitat - and measuring these changes is important. Land is used for different purposes, and measuring the condition and character of these different uses is important. Having two different types of indicators is confusing. We should do a better job of discriminating against indicators - some are useful and some are not.
- Everything that has trees is called a forest. There is no distinction about plantations. Cornfields are not called grasslands. The report should distinguish what is happening in forests versus plantations.

Not-for-Profit Participants

- The Air and Water chapters are implicitly tied to the goals of the CWA and CAA. The Land chapter is not tied to regulations so the EPA should consider tying the Land chapter to landscape integrity.
- The ROE should assess the quality of agricultural land.
- Land Use stands out as having a major impact but it isn't talked about enough in the ROE. Land use is important for looking into the future and especially trying to understand the long-term impact of humans.
- Where are current chemical releases concentrated in space and time?
- What new chemicals are on the horizon?

State Government Participants

- The ROE should contain indicators addressing farmland preservation.
- The ROE should add information about cleanup of legacy pollution. Specifically, the ROE should not use the Superfund list as the only indicator of extent of contaminated land.

Tribal Participants

- The ROE should include more discussion on the impact of land use changes.

Human Health Chapter Indicators and Gaps

Academic Participants

- The ROE needs to have a more thoughtful expression of human health. For instance, the World Health Organization (WHO) definition of health is an option. The WHO definition of human health is a combination of mind, body, and spirit.

Ecological Condition Chapter Indicators and Gaps

Academic Participants

- The Ecological Condition chapter should include a discussion of the impact of ozone on crops.
- A more thoughtful definition of what is meant by ecological health is needed.

Not-for-Profit Participants

- Sources used in the ROE limit the potential outcome of the report. The ROE uses only government indicators and some of the best coastal data live in state and private databases. People for Puget Sound contains one of the best inventories of habitat information of marine ecology in the Pacific Northwest.
- On a national level, the Nature Conservancy has begun ‘bioregional’ mapping and this is a great data set the ROE should use.
- Looking at trends in biodiversity can be very important and the ROE would benefit from this discussion.
- The graph on page 5-8 of the public document shows the imperiled species by ecosystem and shows that the farmlands don’t have imperiled species and this isn’t true.
- The ROE should/could potentially use species as indicators.
- There are many coastal ecosystem indicators that should be included such as loss of sand, species presence, nearshore rocky reef habitat, etc.

Tribal Participants

- The ecological functions of the Ecological Condition chapter, contains no discussion about near-shore ecological function, e.g, shellfish production is down because of . . .
- The ROE should include a better understanding of what the impacts of native vegetation loss are on the Ecological Function.

Discussion 4: Use of the Document

Alex Wolfe from the EPA Office of the Chief Financial Officer described how the indicators will serve as an important tool in priority setting in the next EPA Strategic Planning cycle (which will begin in 2004 for the 2006 Strategic Plan). For management purposes, it would be beneficial to use the indicators to identify where to improve the performance measures that are used in the strategic planning process. It may be possible to use some indicators that have not been ready for management use in the past, but this will require establishing a good baseline. Annual planning requires setting annual targets—even a subset of high quality indicators would be a signal of willingness to commit to a set of measures as part of the annual plan and budget.

Ramona Trovato explained that there will never be 100 percent alignment between the ROE and the Strategic planning efforts because they are different—measures and indicators are going to be used for different purposes. These are overlapping, but not congruent circles. The EPA Strategic Plan, for instance, will not likely include topics such as cancer rates and measures that are from other agencies. Those items that are in the annual plan and budget have to be measurable on an annual basis.

Participants were asked to consider the following questions:

- How have participants used the report?
- How might participants use it in the future?

General Comments on Use

Academic Participants

- As an educator, ROE will be used in the classroom. Students will be asked to identify the relative strengths and weaknesses of the document. The ROE will be a good tool to empower people to think about environmental issues in an educational setting. Students could be asked to answer: Is the ROE a State of the Environment Report? Is the ROE a State of the Environmental Infrastructure Report? Is the ROE the right way to define current conditions? Is it a way to propose solutions? Is it a way to evaluate EPA?
- To increase usability (and a great opportunity) the ROE should have action guidance. The ROE could potentially be used as an evaluative tool at the local level to the national level.
- The cost of the ROE is .00014% of EPA's budget, surely EPA can afford to continue the ROE.
- The ROE could be used as a teaching and learning tool. A third to half of the discussion is introductory and would be suitable for K-12 teachers in preparing lectures in environmental studies. The fact that global climate change is not discussed makes it problematic to use in an educational setting.

Federal Government Participants

- Within NOAA, the ROE could be used by the national managers. The document as it stands is probably good for the public, U.S. Congress, and the EPA. The most important factors to increase usability are to have clearly stated goals, measurable objectives, and report the results.

Private Sector Participants

- The challenge the EPA has to maximize the usability of the ROE is to find the right mix between spin (positive) and doomsday (negative) reports.
- The ROE could be used as ammunition against industry.
- The use of the ROE for industry is limited. Companies are very focused on what they do. It is important, however, to maintain a spread of indicators across all six levels. In the forestry industry, the monitoring is as close to the point of activity as possible (and away from the point of impact, e.g., sediment runoff from roads at the point it leaves the road not at the biological impact down the stream). The challenge is then to find indicators that are able to identify causality.

Local Government Participants

- The educational component of the ROE cannot be overstated. The EPA must market the availability of this document.

Not-for-Profit Participants

- The ROE would be useful to decision makers and anyone who is interested in policy if EPA made the data available on a website, updated in real time. You can get the politics out of the data and the report could be the analysis of the data (political). It is important to bifurcate the collection of information and making the data available different from the report.
- The Report might also be useful if, in addition to the raw data, the ROE listed, the ten best and ten worst of some parameter or success/failure stories.
- The key to the ROE is that it raises more questions than it answers. This provides a snapshot at a national level of what kind of data are missing. The ROE can provide a new sense of goals and priorities.
- The ROE is an excellent source of data for the citizen activist. The ROE would be particularly useful if there were a balance between spin and doomsday and if the information was made more available on the web.

State Government Participants

- For the ROE, because it is the first report of its kind, everybody is the audience. To make this document useful EPA must make the ROE unassailably objective. Additionally if the ROE is comprehensive and focused the ROE can be used for priority setting.
- The ROE can be used as a primer or national briefing book on environmental issues. To be useful the ROE must be credible. Credibility is everything and without the global warming piece the ROE is not credible. It is the burden of the ROE to identify where national trends are appropriate to use and where local trends are important.
- The more consistent Federal, State, and Local environmental professionals can be in developing indicators, the more useful the ROE will be. This consistency will only take place with

partnerships. EPA can leverage its funding role to encourage partnership and dialogue.

- The use of the ROE would improve if States and EPA can come up with a good set of indicators States can use to collect information. Then the process must identify if the state level indicators measure what they need to measure and that they are comparable/aggregable to national indicators.
- The ROE should be used to evaluate national policy. Specifically the report could be used to identify where the data collection and monitoring gaps exist.
- The document should be created every five years.
- The ROE should be lined up with EPA strategic planning.
- The ROE is an excellent Primer for the general public. The ROE could be used in state-level regulatory agencies to highlight where state-level cooperation must occur (e.g., between Environmental Agencies and Agricultural Agencies). Perhaps the most useful part of the ROE is to help understand major successes. There is a real need for outcome-based analysis in regulatory-based performance and the ROE provides good base information for this type of analysis. The ROE could also be used as a measure that could increase targeted funding towards states. EPA could use the ROE to base state funding on environmental performance.
- To increase usability the EPA must be clear on the framework, scope, and audience of the ROE. The audience should be those who deal with national level policy. The use at the state level should be to simply provide a benchmark on relative state environmental performance. At a State level, for policy development, the ROE would have to have substantially more granularity.

Tribal Participants

- It is good that EPA American Indian office is tied to Agency strategic planning effort. You can use the report to evaluate/measure the success of protecting the tribal trust land. The sustainability of tribal culture is currently not available given the environmental condition. Indicators can be used to see if things are changing that can contribute to long term tribal sustainability. The EPA should consider using tribal knowledge to identify appropriate indicators for tribal issues and land.

Multiple Participants

- The recommendations for an appropriate time frame ranged from 3-10 years.

Public Comments

Donna Ewing from the League of Women Voters offered public comment. The use of precautionary principle is important. “I am disturbed that the current administration is spending money to study if climate change can happen - it is happening. Use the precautionary principle to identify indicators that show the impacts of global climate change.”

Halstead Harrison offered public comment on behalf of the University of Washington’s Atmospheric Science department. “I want to express my dismay that greenhouse gases are not in the ROE and the absence of it is frustrating. There is emerging research that shows climate change is happening globally

as well as locally. Yes, there are uncertainties, but we should not allow that to stop us from objectively presenting climate change information.”

Participants

Candice Claiborn, Washington State University
Mark Clark, Washington State Conservation Commission
Robert Clark, NOAA/NMFS Puget Sound Restoration Program
Keith Daman, Daman Farms
John Erickson, Washington Department of Ecology
Donna Ewing, League of Women Voters, Public Meeting Attendee
Kathy Fletcher, People for Puget Sound
Senator. Karen Fraser, Washington State Senator
KC Golden, NW Climate Connections
Patty Gora, Safe Air For Everyone (SAFE)
Halstead Harrison, University of Washington, Public Meeting Attendee
Richard Haynes, Pacific NW Research Station
Chris Jarmer, Oregon Forest Industries Council
James Karr, University of Washington
Larry Koenig, Idaho Department of Environmental Quality
Tim Newcomb, Affiliation unknown (responded to FR Notice)
Phil Peterson, Simpson Resource Company, ppeters@simpson.com
Greg Pettit, Oregon Department of Environmental Quality
Roy Prescott, Local Government Advisory Council
Kevin Ranker, Surfrider Foundation
Yolanda Sindei, Community Coalition for Environmental Justice
Jeri Sundval, Environmental Justice Action Group
Jeff Swotek, United States Department of Agriculture NRCS
Pat Takasugi, Idaho State Department of Agriculture
Terry Williams, Tulalip Tribe
Greg Wright, Washington State Department of Agriculture

EPA Participants

Heather Case, EPA OEI
Lee Daneker, EPA Region 10
Mike Flynn, EPA OEI
Myrna Jamison, EPA Region 10 (speaking on behalf of tribal....)
Joyce Kelly, EPA Region 10
Ron Kreizenbeck, EPA Region 10
Jon Schweiss, EPA Region 10
Ramona Trovato, EPA OEI
Alex Wolfe, EPA OCFO

Other Participants

Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
Robert Willis, Ross & Associates Environmental Consulting, Ltd.

APPENDIX G

Summary of Comments by Chapter

This Appendix provides a brief summary of the comments by ROE chapter based on the comments offered during the National Dialogue sessions and provided on the EPA E-Docket between October 15, 2003 (date of publication of National Dialogue Federal Register Notice) and February 29, 2004 (closing date for comments). This appendix provides only summary observations. The E-Docket provides the full-text version of the comments. The topic headings used in each chapter were derived from the comments themselves, and not from 2003 ROE chapter organization.

CLEANER AIR

Greenhouse Gas/Global Warming/Climate Change

- Greenhouse gas is important.
- The National Academy of Sciences is dealing with greenhouse gas issues—could the ROE report this research?
- Include climate change trend information, even if the information is imperfect. Some information is better than none. Appropriate caveats and information about level of certainty in the data should be included.
- A description of the process of working through the climate change issue would be useful.
- Not including information on climate change, including a simple statement that climate change is an important issue, was like putting a “kick me” sign on EPA’s back.
- Climate change should be addressed in the next report, especially because the report is intended to drive strategic planning processes by EPA and other agencies. Simply saying that climate change is a complex issue is not enough.
- President Bush has established a measure on greenhouse gas (GHC) intensity (GHG intensity measures the ratio of greenhouse gas emissions to economic output, usually expressed in terms of gross domestic product). This could be considered as a future climate change indicator.
- It should be possible to pick a few climate change indicators that are objective and not value judgments—this approach was effective in the rest of the report. Using such indicators would likely obviate the need to even mention that the data are controversial.
- The level of knowledge and gaps should continually be discussed. This is different than simply providing transparency. It’s important not only to report on what’s being done, but what the bigger picture is of what needs to be done in environmental protection.

- A discussion of approaches to conservation (e.g., the use of less fuel) should be included as it contributes to climate change.
- EPA should discuss how other media are affected by climate change. It is not just an “air” issue.
- The omission of climate change in this document damages its credibility.
- Climate change is an important issue and there should be a question on it reserved in the ROE. An environmental indicator is a scientific measurement of a trend and it would be good to include an indicator trend, such as global temperature information and greenhouse gas emissions. NOAA can provide these data. Another climate change indicator could be water runoff/snowmelt numbers. These numbers should be presented as objective measures/indicators, they are not political numbers.
- Another way of depicting climate change information without labeling things as greenhouse gases would be to label them as gases coming from motor vehicles.
- The ROE should contain raw information that may be relevant to climate change. For example, it could include information about glacial loss and show a chart of glacial levels in National Parks.
- The document should not have omitted climate change. The dialogue should be about how the results of climate change are represented, not whether it should be represented. The basic science of climate change is no longer controversial. It is EPA’s responsibility to rise above political motivation and publish the science first. The talk about what to do about it can come later. This is a state of the environment (not linked to outcomes, or what to do), and that gives the EPA license to publish climate change science. EPA doesn’t have to be on the front lines.
- The omission of any discussion regarding the nature of greenhouse gas emissions, their sources, and methods to reduce them leaves the impression that climate change due to man-made greenhouse gas emissions is not an important problem. The EPA’s job is to protect the environment and United States citizens from harm due to environmental problems. This report does not fulfill that mission. Another mission of the EPA is to inform the public of current science regarding environmental problems. This report fails in this regard also.
- No assessment of the state of the environment can claim to be comprehensive without credibly addressing global warming. “...we urge the EPA to release the final Report on the Environment with the original climate change section reinstated.”
- In keeping with the intent of the ROE to present environmental data independent of assessing the success of EPA’s (or other agencies’) programs and activities, the Agency certainly should include trend data on climate change indicators and greenhouse gas emissions in the ROE.
- While there may be disagreement or dissension on many issues related to global climate change and the contribution of greenhouse gas emissions toward climate change, the

possible consequences of such change warrant attention to the subject in a report on the environment.

Air Toxics

- There is not enough information on air toxics or on emerging pollutants.
- A challenge facing EPA is improving understanding of the impact of toxic and other hazardous pollutants on environmental quality and human health, including assessments of emerging pollutants not currently recognized as having adverse effects.
- Information is available (e.g., on air toxins) that was not included in the report.
- The report should include air toxics.
- EPA should consider additional information or data sources in the final report, such as the National Air Toxics Assessment (NATA).
- EPA should use more current data (than the 1996 data referenced in the Executive Summary and Air Chapter) for the National Toxics Inventory (TRI).

Transportation

- The National Highway Cooperative Research Program (NHCRP) has put out a report call Travel Matters (see www.travelmatters.org) which allows calculation of individual contributions to emissions. This is useful to help individuals understand their effects on air quality.
- Some discussion about the intersection between vehicle miles traveled (VMT) and public transportation would be useful.
- A good question in the air chapter would be on the effects of transportation on air quality. There may be four or five metrics that could answer this question.
- Other indicators that might be included are: miles driven, commute distances, percentage use of transportation other than cars, emissions from equipment other than cars, urban heat islands, noise levels, night-time light pollution, asbestos.
- What are the impacts to air quality due to trucks?
- “Vehicle Miles Traveled” is an indicator that is missing.
- The ROE states that NOX emissions are going up and this increase can be attributed to off-road vehicles and diesel vehicles—is this true?

Indoor Air Quality

- More information and indicators on indoor air and the risks to human health should be

included—this is a definite gap in the ROE.

- Indoor air quality is a priority indicator. (2 comments)
- One participant suggested that indoor air does not seem like an issue EPA should deal with. Another participant noted that it was important for EPA to consider indoor air.
- It is difficult to understand how indoor air quality can be talked about at a national level.
- There could be a discussion of what human health effects are influenced by indoor air. For indoor air, it isn't clear if the number is estimated or actually a death-response (Radon). This number should have some qualification—there is more clarification needed on this issue.
- EPA should use the ROE as a vehicle to establish a suite of meaningful indoor air quality indicators, and to identify data gaps that currently prevent the assessment of such indicators.
- EPA should work closely with other agencies, such as CDC and state/local health departments to develop data on other indoor air pollutants (e.g., molds, cleaning compounds, viruses, bacteria) to develop methodologies for correlating existing health data to levels of indoor air pollution.

Ozone

- The air section has a lot of emphasis on acid rain but lacks other air pollutant issues, such as tropospheric ozone, nitrogen deposition, and bioaccumulatives (e.g., metals). Ozone effects on shrubs should be included..
- For ozone, it would be beneficial to know how many people are affected and also how many areas are being affected and the spatial extent.

Mercury

- The report should discuss mercury deposition.
- There is a lack of information about mercury in the air chapter (e.g., how mercury in the air can affect fish). The connection of acid deposition and its effects on fish should be clarified.
- Cross-border information on issues such as mercury deposition from the jetstream (estimated to be 40% of total mercury load in ten years) should be included.

Fires/Smoke/Visibility/Particles

- Including information on the effects of wildfires and other natural disasters on air quality, the environment in general, and human health would be helpful.

- Outdoor air quality due to smoke (fires) should be included. This affects some parts of the country (e.g., the west, California) more than others. Smoke should be linked to chronic diseases such as asthma.
- Smoke from forest fires is an air quality issue.
- One gap was the exclusion of outdoor air quality information for rural areas.
- There is a good discussion of the effects of fine particles and there is now a link of heart attacks with fine particles. Ultra-fine particles is a missing indicator.
- A useful Air Quality measure would be a short-term Air Quality index for PM_{2.5} and PM₁₀.
- Is it possible to be more specific about the visibility indicator (National Park or city)? Many readers wouldn't know what a Class 1 Monitoring Site is.
- In the Air Quality section (1-3) the discussion of visibility is a good example of summarized data being potentially misleading. Currently, the EPA or the President are relaxing the air quality standards in National Parks and there is nothing that indicates this is happening. This positive spin may put people to sleep..
- The discussion of particulate matter should include information on the various kinds of particulate matter and the fact that they may pose different health risks.

Air Quality Index

- The use of the Air Quality Index (AQI) and the NAAQS is confusing.
- The air quality index (AQI) unnecessarily aggregates information. The ROE should simply represent the concentration of each of the pollutants. The AQI does not work because, for example, two airsheds could have the same AQI, but in one all six criteria pollutants could be “bad”, while in the other, just one could be causing the degradation and there is no way to tell just looking at the AQI.
- The AQI does not work for sensitive populations. Children who are sensitive react much more quickly than the AQI can help address.
- EPA should explore how it can report air quality data for different risk populations in a way that those populations are better informed regarding the risks of air pollution exposure.
- The Air Quality Index is not useful because it is meaningless to the sensitive populations. There need to be measures/indicators that work for all stakeholders.
- A more useful composite AQI indicator could be based on a weighted average of the individual pollutant AQI values - where ozone, particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide are multiplied by weights established for each of the pollutants (possibly related to morbidity or mortality rates or economic losses).

- The AQI needs to incorporate in a meaningful way concurrent exposure to multiple criteria pollutants, and chronic exposures.
- EPA needs to clearly explain how the percentage of days of AQI at elevated levels is calculated.
- EPA should clearly identify the limitations of the AQI to address environmental impacts other than health and develop a system for assessing non-human impacts of air pollution.

Other Approaches/Miscellaneous Ideas

- The report has too much emphasis on the criteria air pollutants (NAAQS).
- There should be more information on the sources of air pollutants, especially in the ambient air discussions.
- It would be useful to know what agencies, including local jurisdictions, are doing about air pollution.
- More information on the reasons for trends (e.g., pollutant increases or decreases) would be useful. People want to know what has been successful and why things change.
- The questions on air quality standards should include a next level of detail with questions and indicators on state and regional standards.
- The indicators that measure the number of people living in areas with air quality above “x” are problematic because the “x” is tied to the specific regulatory level. The indicators do not reflect the degree of public exposure to poor-quality air or the actual number of people exposed because the indicator’s population is based on the number of people living in non-attainment areas.
- EPA should assess the trend over the last 20-30 years in the indicator that measures number of people living in areas with air quality concentrations that sometimes exceed NAAQS. EPA needs to clarify what is meant by “at times” in this indicator.
- It is unclear what the indicators that relate to the question on concentrations of outdoor air pollutants are based on. The basis (e.g., average or highest) will greatly influence the indicator’s results or “message.”
- Use of design value could be used as an indicator. It is based on a formulation that EPA has come up with and everyone follows and can be used for comparison purposes.
- At times, the aggregation of data did not make sense. For instance, the six criteria pollutants were aggregated but it would have been preferable to see trend lines for each.
- It would be useful to see the raw values of concentration and the standard deviations of the concentration values. This could also aid in credibility—you could simply add the raw information without interpretation.
- It is important to emphasize and reiterate the point about the life cycle analysis of the

indicators. Specifically, in the Air Chapter discussion of quality, the ROE needs to answer, “What are the main contributors to change?”

- The ROE should include Air Quality indicators for smaller cities.
- The ROE should include a section on odor.
- This chapter would be strengthened if air quality issues were more directly tied to health effects.
- Time frames for trends should be consistent and data should be as current as possible.

PURER WATER

Water Use/Supply/Demand

- There should be more detail on water use and water availability. This issue is now becoming important in the Eastern United States as well as the West. Per capita consumption should be tracked.
- More information on supply and demand would be useful. They are related. Quality may be good, but there is not enough water.
- A goal should be set for sustainable use of water and it should be “pitched” to the public.
- Water quantity is an important issue.
- Michigan DEQ has just finished a document that includes information on the quantity of water and includes cross-border information. They found that there are major data inconsistencies and that the data are not in a format that most people would find useful. These findings mark a water data gap.
- Water supply is important and is not addressed in the ROE.
- The loss of flow through the removal of fresh water should be mentioned in the report. (In the Mississippi Delta this is a big issue.)
- In the section describing hydrology, there is a gap in discussing total flow. A possible indicator could be early flow by year type (e.g., dry year). High and low flows discussion isn't enough.
- The increasing shortages of quality fresh water are of concern.
- The ROE focuses its water discussion around water quality at the expense of water quantity. The ROE should talk about water quantity. A potential indicator is the extent of aquifer depletion.
- Talking about water quantity in the context of water quality does not give readers a sense of how precious and limited fresh water is. The context should state that fresh water is a very limited resource.

- The ROE should include a discussion about water quantity, specifically, the loss of water quantity and the impact of groundwater recovery. The environmental issue is complex and it spans different areas, the runoff is being piped (land cover issue), so that means less water in the river (water quality issue), which leads to higher concentrations of regulated and unregulated pollutants (Water Quality, Human Health).
- Water consumption should be included as a fifth critical component in the chapter. This should include a discussion of water use patterns, measures of water use efficiency and the impacts of water use patterns on the other four components in the chapter.
- Water consumption should be included.

Oceans/Marine/Coasts

- The ROE should include information on oceans.
- Global warming and sea level change should be addressed.
- The indicator for clarity is not appropriate for coastal waters - there is a lot of variation across the country.
- The three indicators under the question about the condition of coastal waters are all highly correlated with one another and therefore are not distinct. This isn't made clear. Other indicators could be selected such as shoreline modifications, invasive species, water levels. An indicator that provides data on the extent of hardened shorelines or dyked wetlands would be useful.
- There should be more information about coastal environmental quality, wetlands, and non-point source pollution.
- Include a question such as "What is the condition of coastal waters?"
- Expand the coverage of coastal waters (Alaska, Hawaii, and offshore) and consider the land based sources of pollution and their effect on receiving waters (e.g., coral reefs).
- In the Water Chapter, the beach closure indicator is flawed (poor indicator). Beach closure information cannot/should not be aggregated, the ROE should look for individual samples for beaches. Also, using lack of sampling is a bad indicator for beach closure -- the ROE has to find out where the water isn't being tested.
- There are no references against which the significance of "beach closure or advisories" can be measured. Also, the indicator must be normalized to population equivalents impacted. A more useful indicator would be the percentage of population equivalent beach days impacted by closings or advisories. Another option is linear shoreline extension impacted by beach closings. The reasons for beach closings should be clarified.
- The ROE should include information on coastal health. Potential indicators include: inventory of healthy, natural sandy beaches; loss of sand on beaches; and, extent,

degradation, and quality rookery habitat. The PEW Ocean Commission and U.S. Commission on Ocean Policy Final Reports are or about to be issued and the ROE should be deferential to these for the ocean sections.

- The map on estuary health is nice but water clarity is a bogus indicator of estuary health in Puget Sound because clarity simply indicates that plankton are gone (which is not good). As soon as the ROE begins trying to look at ecosystem health it becomes such a complicated picture that indicators at a national level become problematic but the more you go towards ecosystem health the closer you are to a real state of the environment report.
- Nearshore habitat functions should be included as these are limiting for salmon and shellfish.
- Why are only 3 out of the 7 indicators discussed in the *2001 National Coastal Condition Report* used in the ROE? (Sediments, benthic conditions, fish contamination, loss of coastal wetlands are not included.)
- The significance of the phosphorous and nitrogen goals in the Chesapeake Bay sidebar should be explained.

Fragmentation/Channel Modification

- The report does not address the fragmentation of aquatic systems and how this affects in-stream processes and sediment moving through aquatic systems.
- Fragmentation, both in the landscape and in water habitats, is not discussed and should be.
- An indicator should be included on natural versus altered/modified channels.
- The report does not address the fragmentation of aquatic systems and how this affects in-stream processes and sediment moving through aquatic systems.

Fish

- Fish consumption advisories are controversial and a difficult measure to compare because data are collected differently in each state.
- EPA should tell the story behind the data on fish advisories. These are measured differently by every state. The more pollutants are looked for, the more they are found.
- Under the discussion on fish and shellfish, there needs to be a recognition that EPA standards are not the same as states. When advisories are used - the standard against which they are measured needs to be identified.
- For the fishery section, the ROE needs to cover habitat loss.
- Under the question: “What Human Health Effects are Associated with Consuming

Contaminated Fish and Shellfish?” - The sentence on mercury reads, “Mercury is toxic in sufficient quantities, especially to the nervous system.” Here is an example where the EPA could have provided better context for the information by, e.g., noting that most of the fish and shellfish consumed in the United States has mercury nowhere near “toxic” amounts - that the risks are there for unborn children of women who eat large quantities of fish with high levels of mercury, but the vast majority of fish and shellfish are below FDA and EPA levels of concern.”

- EPA should explore how it might factor carrying capacities of impaired water bodies to derive a more robust indicator of the loss of consumable fish or shellfish production capacity.

Impervious Surface

- An indicator to consider for the water section is the amount of impervious cover *per capita* in suburbs vs urban areas.
- EPA should look to regional and state efforts using maps to estimate impervious cover and aggregate this information nationally.
- EPA needs to relate the significance of imperviousness to trends in other indicators that contribute to non-attainment of water quality objectives for the watershed being studied.

Invasive Species

- The discussion of freshwater resources should include the effects and prevalence of invasive species.
- Suggest a more detailed accounting for invasive species in our waterways. In Chicago, we are facing the ever-approaching threat from Asian carp, an invasive species that is migrating up the Mississippi River.

Groundwater

- There is not enough emphasis on groundwater (quality or amount).
- The quality of groundwater is an important issue (especially as a private drinking water source). A discussion of this topic should be included in the report.
- More information on groundwater should be included —both quantity and quality. How many states have comprehensive groundwater plans/issues?
- Groundwater quality and quantity are not addressed as well as they could be.

Water Chemistry/Quality

- The water indicators do not address water chemistry (dissolved oxygen, pH, connectivity, turbidity, etc.).
- Combine some indicators such as toxics and PBT's and discuss as chemical contaminants in streams and groundwater.
- There appears to be no information on MTBE.
- A discussion on endocrine disruptors should be included in the water chapter.
- If the 2002 state-based water quality inventories indicate that water quality is getting worse at the state level, these data should be included. General overall water quality data are missing.
- The ROE is not structured with questions that ask about specific chemicals, such as mercury or the load of "x" in water that affects quality, and yet there are those (and other) specific indicators—this appears to be a mismatch.
- It would help if information on emerging issues such as pharmaceuticals and hormones in water supplies and nanotechnology were provided.
- The omission of the state water quality monitoring data is alarming. The states do a lot of work in this area and there should be a plan for making the state data usable for indicators.
- When discussing acid rain, there should be mention of the acid rain impact on impaired water bodies.
- EPA needs to ensure that "toxic releases to waters of mercury, dioxin, lead, PCB's, and PBT's is revisited regularly and expanded as necessary to address emerging pollutants that are not currently recognized as toxics.
- EPA should correct the statement that PCB production ceased in 1997. PCB sales were voluntarily discontinued in 1977, preceding EPA's 1979 formal ban.

Wetlands

- The report should address the loss of priority wetlands.
- The regulated definition of wetlands keeps changing, but that does not mean that wetland functionality changes. How will EPA deal with these differences over time? There should be some way to regularly assess gross numbers and quality. (There is an example in California, where wetlands were restored with increased water flows as part of the CalFed project, but they were saturated with mercury—so there are more wetlands, but they are not useful for some purposes.)
- Quality has to be discussed when discussing quantity of wetlands.

- The size of the wetland could be easier to capture as an indicator than quality (e.g., the number of large wetlands are decreasing). Small wetlands and large wetlands play different roles. It would be difficult to do something at a more national level about wetlands quality. The U.S. Fish and Wildlife Service wetlands data is poor and should be qualified in the report.
- Capturing useful information about wetlands is difficult at state and national levels. A surrogate indicator, such as the presence of rare species to wetlands, should be considered. There are not a lot of surrogates out there that are part of a legitimate data gathering system.
- The wetlands indicators aren't specific enough to document the issues affecting wetlands—they only measure degradation.

Watersheds

- Include more on watershed protection.
- It is important to include information on perennial streams with respect to water quality and health. Perennial streams are about 70% of watershed-based streams, but they are almost completely ignored in both monitoring and scientific assessments.
- The presence of native vegetation and how it helps to support watersheds is important.
- Cumulative watershed indicators should be included.
- The ROE watershed discussion is too focused and isn't looking at the right level. The environmental community needs to figure out how to look at watersheds in a less aggregated way. For instance, watershed alteration because of the removal of old growth may show changes in micro-climate, which affects how the air is cooled. El Nino effects have watershed implications on rain and water and snow patterns. When we concentrate on smaller scale watershed issues (e.g., national water quality) we lose what is happening at the large-scale watershed level.

Biologic Components

- The bioassessment storm water monitoring data should be able to be used as an indicator.
- The presence of micro-invertebrates could be used as an indicator.
- Bio-assessments are important indicators.
- Measures of biological oxygen demand, which determine marine life in lakes and streams, should be prioritized.
- Source tracking of bacteria in recreational water sources should be included.

Drinking Water

- The indicator of “population served by community water systems that meet all health-based standards” is not an indicator of environmental quality. Population trends and capital investments influence the size of populations. Health-based standards would be capital investment in water treatment systems and system performance.
- The statement about “limiting concentrations of disinfection by-products in drinking water, while ensuring that microbes are kept in check, will have a positive effect on public health” is not an objective measure or indicator, but rather a strategic goal of EPA’s Drinking Water Program and should be noted as such, or deleted.

Approaches

- The report does not explain how improvements in detection limits for water quality sampling equipment causes some pollutants to be reported that were not previously shown (i.e., not due to increased pollution). The ROE is an opportunity to explain this in detail.
- EPA should establish a “leading” indicator for source water contamination.
- Indicators should be contextualized relative to natural variation. For example, the water chemistry of estuaries varies greatly depending on the type of forest and soil of the drainage.
- One possible indicator could be the ability/capacity to do monitoring work or how much monitoring is going on, and of what quality, etc.
- More information on water quantity in general, including flow and distribution (e.g., flow and pumping) and a discussion of who gets what water when would be useful and would help people to see things from a landscape perspective.
- The report does not mention the State of the Lakes Conference, a joint effort between Great Lakes agencies and Environment Canada. The Surface Ocean - Lower Atmosphere Study (SOLAS) project has been developing indicators that would be good additions to the report.
- There is a lack of information about the linkage between water quality and quantity.
- In some instances, available historical trend data were not included (e.g., historic levels of wetlands beyond the last fifty years). Providing these data would give readers a more complete context. They can be included even if there is less certainty about the reliability, as long as the level of certainty is reported.
- It would help to identify what the right measures are to start with. For instance, there may be different biological indicators (for water) and these indicators may vary from place to place around the country. Biological indicators are likely to be the best indicators for water. States may want to have a single set of goals around these

indicators, even if the specific indicators vary.

- There should be an effort to aggregate data (e.g., stream ratings data) in some way, even if states use different measures. IBI is one way to do this, but it is difficult to assess “undisturbed” conditions for streams.
- National-level data sometimes leave a skewed impression when there is regional variation—need to be clear about significant regional variation in the data (e.g., groundwater recharge).
- Although eutrophication and anoxic zone in Gulf of Mexico were mentioned in the ROE, there should be an indicator on the sources of nitrogen, not just the level of nitrogen. The ROE should also include a discussion of point sources versus non-point sources, which are major contributors to the eutrophication problem. At least a discussion on the difficulty of regulating the two and how hard it is to get to the non-point source data would be helpful.
- EPA should acknowledge that eutrophication can and does occur in the absence of human activity.
- Indicators on non-point source pollution and ecological effects of land use in coastal waters and wetlands areas (particularly along the gulf coast area) are important.
- In Arizona, there may not be a single tribal water system that is represented in the current data.
- Consider an indicator such as investments being made in sewage treatment plants that then prevent pollution. (Dollars are not being made available to 2/3 of the plants in Chesapeake Bay and they are not functioning properly.)
- USDA as a whole has information on outcomes related to clean water.
- The ROE should consider using probabilistic water sampling.
- To bolster the gaps in water quality data some of the local information must be integrated. For instance, Oregon has water sampling from 1949.
- The ROE should document that a potential reason for the gaps of information in the Water chapter is due to the fact that the CWA is a state-level implementation. (As opposed to Clean Air Act, for which information is collected consistently nationally, resulting in more complete information for the Air chapter). The ROE should document that Air has national standards and Water does not.
- The Water chapter should have new indicators for water biointegrity—dissolved oxygen, turbidity, fecal contamination, and temperature. For all indicators, wherever possible, the ROE should strive to show the actual data (not the interpreted data) and all caveats.
- The ROE should begin trying to make linkages between level 2 and higher level indicators. For instance, in Water, there could be a link between nitrate load and stream water load (flow).

- Data collected on water bodies does not necessarily lend itself to rolling up to national indicators. Using a different scale, e.g., regional or watershed, may be more appropriate to measure the state of the water bodies and to show improvements, which is the ultimate goal.

BETTER PROTECTED LAND

Population Growth

- A global pitch is important, including what impact people have on species.
- A discussion of the population growth effects on ecosystems should be included in the Land Chapter.

Land Use/Protection/Urbanization

- There is a whole indicator set on land use and environmental quality that is missing. The rate of land protection should be included. “How much land is being saved?” should be asked.
- For every dollar we spend in redevelopment, developers spend 10 to 100 developing property. A good indicator would be how much land is being redeveloped vs. green lands being developed.
- You can’t ignore land use simply because EPA does not have power to regulate it.
- There needs to be a discussion about the fact that the country is urbanizing faster than population is growing. Trend data are really important.
- The indicator on grasslands should present how much we are saving through environmental management efforts.
- The ROE needs some type of *per capita* index of land consumption, perhaps a ratio related to population.
- A good indicator for the land chapter would be: the number of new housing units relative to new households.
- The impervious surface sidebar is good, but a better reference than a conference proceedings is needed. New science is indicating that even less impervious surface than previously thought can cause watershed degradation. More comparisons of acres of impervious surfaces per area of development, or dollars spent on development versus open space preservation, or rates of urban development versus green field preservation would be useful.
- An indicator might be amount of impervious surface per capita in suburbs versus in urban areas.

- Land use should be connected with water use and ecological condition.
- Land loss in Louisiana (Mississippi drainage) is most important.
- When examining land use categories, such as urban and suburban, having a more specific breakdown could help land use planning and policy decisions.
- Information on land use alone does not define the condition of the land. It would help to also explore what the impacts of particular land uses are. For example, fishing may be safer in agricultural lands than urban lands. The National Resources Inventory could help to examine issues, such as the amount of erosion coming from land use types and wind and water erosion by region. These types of statistics would be more useful than just discussion of the number of acres.
- Some indicators should be developed to talk about changing agricultural practices and the effects on the environment (e.g., Confined Animal Feeding Operations (CAFO's) and changes in the intensity of agricultural operations).
- The issue of how much farmlands affect water quality is buried in the chapter. The problems are associated not only with CAFOS, but also with runoff , etc.
- There should be more information on transportation and buildings.
- There should be questions about whether we are using developed or farm lands well and/or on the condition of farm lands, rather than what is the extent of developed or farm lands.
- Wetlands should be included in the land discussion: many people associate wetlands more with terrestrial habitats than with water.
- In the land use discussions - developed and farmland are not necessarily negative. Farmland and urban lands may have "best management" practices - and these should be described.
- Everything that has trees is called a forest. There is no distinction about plantations. Cornfields are not called grasslands. The report should distinguish what is happening in forests versus plantations.
- .The ROE should contain indicators addressing farmland preservation.
- The ROE should assess the quality of agricultural land.
- Land Use stands out as having a major impact but it isn't talked about enough in the ROE. Land use is important for looking into the future and especially trying to understand the long-term impact of humans.
- The ROE should include more discussion on the impact of land use changes.
- The ROE tracks the extent of farmland. Does EPA assume that an increase in land devoted to farming is good or bad for the environment?
- An important land indicator that should be included is the amount of critical wetlands and

riparian habitat. The loss of these lands through conversion to other uses is a land use indicator.

- The discussion of ecological effects associated with land use should more generally address the potential for terrestrial and aquatic habitat destruction as a result of land development, agriculture, and forest uses of land.
- EPA should better link the discussion of farmlands to the discussion of pesticide and fertilizer use. (See E-Docket comments for more details.)

Habitat/Land Cover

- There might be consideration given to an indicator on “risky behavior” (e.g., people building in flood plains and the urban-wildland fringe fire issues). These have impacts on land cover and ecosystems.
- The forest information focused a lot on the number of acres of forest land, but was lacking information about the kinds of trees and forest types. There should also be discussion about the wholesale change in forest types in some areas of the country due to management practices and natural events and major disturbances.
- The Forest Inventory and Analysis is a good source of data, even though it does not cover all forest lands in the nation.
- Carbon storage should be an indicator in the forest section.

Waste

- The land chapter should include more than just EPA waste sites, the states have more data.
- State-tracked waste data is readily available and should be included.
- The persistence and accumulation of medical waste is an important issue to track. This is currently not represented in the report.
- The waste section would be improved if the issues or risk of radiologic exposures and radioactive wastes were included.
- More information on biosolids should be included, such as where a majority of biosolids go, whether there are health risks associated with the use of biosolids, and thinking about "beneficial reuse."
- Information on landfill/disposal site capacity, which factors into land use and related economic issues, should be included in the discussion of waste management.
- Include a separate question on recycling rather than including recycling within the waste management discussion.

- Again, recycling should be a separate indicator and not simply part of waste management.
- Even if indicators on important issues such as availability of waste disposal capacity and land application of biosolids are included, EPA needs to be careful about how it defines terms and projects amounts of municipal waste generated versus amounts managed or disposed. Hazardous waste has been defined and tracked more carefully than have other kinds of waste.
- There is a gap around information on the amount of waste being shipped/imported-exported between states and internationally.
- It is unclear how tracking the “21 forms of waste and contaminated lands” included as part of Appendix B will provide a profile of environmental results.
- The indicators selected for the “Waste and Contaminated Lands” do not adequately represent or measure the impact of EPA’s waste management and remediation programs on improving the environment.
- While the ROE suggests there is a correlation between adverse health impacts and proximity to contaminated land, EPA has not developed any indicators of such effects.
- The number and location of NPL and RCRA Corrective Action sites does not provide an adequate or accurate assessment of contaminated lands.
- Current NPL sites is not an accurate indicator of potential candidate sites for NPL.
- Information on RCRA corrective action sites is readily available from states and should be included in the ROE in lieu of EPA estimates.
- There is limited value in identifying the number and location of MSW landfills and RCRA hazardous waste facilities. This is data with no context.
- There is no data on hazardous waste generated by Small Quantity Generators (SQG) and conditionally exempt small quantity generators (CESQG), yet these are of concern to the states. EPA needs an indicator to address the issue of their potentially unsound waste management practices and financial insolvency.
- EPA should develop an indicator tracking how much hazardous waste is combusted for energy purposes.
- EPA should track the amounts or types of hazardous secondary materials that are being recycled.

Chemicals/Pesticides

- Under the discussion of chemicals in the environment, there should be a discussion of endocrine disruptors and genetically modified organisms.
- The report does not contain indicators for chemical applications and pesticides from

lawns and golf courses.

- In the chemicals section, caution should be used on how information on pesticides is communicated—this is not nearly as big of a problem as the public thinks it is.
- The section looking at pesticide use is incomplete in that it only looks at agriculture data and not at pesticides used in urban areas. (There is an EPA study that shows much higher use of urban than agricultural pesticides.)
- There is no discussion of pesticides in the summary and no breakdown on the types of pesticides considered (e.g., respiratory oxidants).
- The chemical data listed in the landscape section rely only on TRI data—the shortcomings of TRI data must be discussed (e.g., self-reporting, the unknown chemicals, and the TOSCA limitations).
- The chemicals in the landscape section would benefit from additional context. For instance, how many new chemicals have been introduced and what chemicals haven't been considered?
- Where are current chemical releases concentrated in space and time?
- What new chemicals are on the horizon?
- The use of the word “release” when describing TRI is likely to be confusing or alarming in implying unregulated or unmanaged wastes that are a risk to human health and the environment.
- Data on chemical releases in this chapter should be limited to releases on land (rather than all releases).
- The discrepancies in data of numbers from TRI and TOSCA should be discussed. (See E-Docket for more details).
- EPA should include specific information on organophosphate use in addition to the general discussion on herbicide and insecticide use.

Invasive Species

- The land section may benefit from discussing invasive species and linking that with commercial value (e.g., the presence of tea grass affects how many cattle can graze per acre).

Food

- Consumption advisories for wildlife other than fish could be considered (e.g., ducks).
- The food issue seems mixed up with the land issue—but it doesn't make sense. Pesticide exposure isn't from dirt but in food.

- Consider including an additional chapter devoted strictly to food—this discussion does not belong in the land chapter.

Contaminated Lands

- The report should address what percentage of Superfund sites still contain residual contaminations that could be a problem for fish and wildlife.
- Contaminated lands are a huge issue. The Superfund Program is going broke and there is no hint of danger ahead in the report.
- The ROE should add information about cleanup of legacy pollution. Specifically, the ROE should not use the Superfund list as the only indicator of extent of contaminated land.
- EPA should explore the development and inclusion of two additional indicators, representing the time and cost to fully address all known remediation sites.

Erosion

- The cost of coastal erosion would be a useful indicator in the Land chapter.
- In the Land chapter, the ROE should add soil erosion as a question.

Fragmentation

- Fragmentation, both in the landscape and in water habitats, is not discussed and should be.
- There needs to be a discussion of fragmentation in this chapter. Some of the fragmentation data could go beyond the obvious categories and include agricultural fragmentation, parcel fragmentation, and changes in ownership over time, which have impacts on forests, wildlife, and ecosystems in general. (The average length of ownership of private forest land parcels is 7 years. As land turns over, goals for management change, affecting land uses and services.)
- The effects of global warming on habitat fragmentation and land cover should be included.

Approaches

- There needs to be discussion about why some of the issues are important. Why do we care about grasslands? Because we need to know if we have enough to support what is needed (e.g., the species that are dependent on grasslands). The issues should be expressed more in terms of sustainability.

- The land use questions are problematic. They are presented in a way that is different from the other indicators. It takes too long to get to the “so what.” The questions in the document ask, “what is the extent of developed land”, but this does not get to the issue of loss of natural resources or agricultural lands due to development practices.
- It may be ok that the land indicators are presented differently. The report should present why the land indicators are important. It would help this section as it is a “newer” environmental issue - and may need to play out for 20-25 years. More detail on trends and what could happen if current trends continue would be useful.
- Land use is important, but it should not be a measure of EPA’s performance or of State DEPs - because these agencies have no tools to affect land use. The work horse statutes (e.g., Clean Water Act, Clean Air Act) drive most of the progress represented in the report, through all of the changes in administrations. People that work on these programs account for much of this progress.
- Land use impacts should be presented in context of other issues (e.g., sprawl). EPA needs to look at ways to collect indicators together to frame issues.
- The ROE should emphasize that EPA does not have jurisdiction or tools to affect land even though land use is an important issue.
- EPA’s work on “smart growth” has been important and shows that EPA is involved in land issues. Indicators might be developed to address whether “smart growth” is working.
- There should be a separate section on land /ecosystems and a section on toxics and waste. The first could focus on forests, wetlands, endangered species, etc, and the latter on TRI . The food chain should be included.
- An indicator could be the aid that the US gives to other countries for environmental protection.
- Make more connections. If streams lose fish and/or water quality declines, then property values decline.
- The economic (e.g., ecosystem services provided by wetlands) and social values of certain land cover classes and land uses should be discussed.
- The geomorphology and how land surfaces have changed over time would be useful to discuss as they affect nutrient levels, and how these have changed, and how historical levels will not be achieved again.
- Information about the importance and effects of conservation is missing. The NRCS has a Performance Results Measurement System which includes data at the county level on such things as acres of buffers that have been installed. The National Resources Inventory could provide a baseline for these data. This system is evolving to track all conservation practices installed (approximately 1600 different treatments). The data are available on-line in a system to be called (PRS).

- The challenges to collecting good land cover/land use data (including data on forest types) should be acknowledged at the beginning of the chapter or sections. It is good to be up front and realistic about the data that are not likely to be available.
- There may be areas where forest data can be updated—timber harvesting is down but there are new data emerging about fuel management and the urban/rural interface. Many private and non-profit agencies will be mapping this interface and EPA will receive this information. EPA could “teach” these entities how to compile the data to begin to fill gaps. .
- The graphic on pgs. 5–13 makes it seem as if erosion stops at the border of Texas. The ROE should discuss the data gap impact on certain graphics.
- In the Land chapter, the ROE should have information on energy use and the sources, and include a category on military base pollution. Another potential important piece of information the EPA should consider adding is the potential for pollution of different transport mechanisms. In the current ROE this is an instance of what we know that isn't emphasized -- the ROE says pollution from different transport mechanisms may or may not cause health effects, but we know it does.
- The Land chapter feels like an odd Ecological Condition chapter. Ecosystems are changed in different ways - logged, urbanized, grazed, planted and harvested which affect their ability to provide habitat - and measuring these changes is important. Land is used for different purposes, and measuring the condition and character of these different uses is important. Having two different types of indicators is confusing. We should do a better job of discriminating against indicators - some are useful and some are not.
- The Air and Water chapters are implicitly tied to the goals of the CWA and CAA. The Land chapter is not tied to regulations so the EPA should consider tying the Land chapter to landscape integrity.
- EPA should strive to work with other federal, state, and local agencies to develop indicator(s) that assesses both the aggregate and media-specific environmental and economic impacts of land use decisions, in effect, an eco-economic indicator of quality land management.

HUMAN HEALTH

Health-Environment

- The report should expand its definitions to include statements such as: “The American Cancer Society reports that 3 percent of cancers are environmentally caused.”
- The blue boxes describing health indicators are misleading (e.g, pg. 4-8). It is hard to understand the environmental and health linkages represented in the graphics without first reading the narrative. Better connections need to be made to the environment, rather

than just a list of health conditions.

- It is important to keep the health indicators, as they are the reason that many environmental regulations are written.
- Indicators that mirror environmental health priorities such as 1) enteric diseases (e.g., salmonella, food born illnesses); 2) blood lead; 3) chemicals in wells (e.g., toxins from dry cleaners, NPL, and gas stations); 4) small contaminated sites not on the NPL caused by LUST and wastes; and 5) radon, mold, indoor air as it relates to asthma - are most important.
- The Human Health Chapter does not do enough to make connections between health and the environment. The health sections in each chapter are good and should be better tied with the Health chapter overall.
- There should not be a separate chapter on environmental health. Health linkages should be mentioned in the relevant media-based chapter (e.g., asthma in the air chapter).
- It is critical to have a health component somewhere in the report - as most environmental regulations are written for the purpose of protecting health.
- The Human Health Chapter is problematic. Some health effects are highly related to lifestyle and not directly linked to environmental issues, as represented in the report. Caveats should be used to clarify those health conditions that are not directly environmentally related. This is especially true in the blue boxes.
- The Human Health Chapter does not do enough to make connections between health and the environment. The health sections in each chapter are good and should be better tied with the Health chapter overall.
- The questions on the health status and trends imply a linkage between ambient environmental conditions and specific health conditions simply because they are included in the ROE. But very few definitive environment/health linkages can be made right now. This needs to be very clear in the report, because in a table or simplified form, people can take it out of context and make causal linkages for which there is no real evidence.
- In the box: “Children’s Environmental Health: Selected Indicators” - all the diseases listed (cancer, birth defects, asthma, etc) MAY have an environmental component in some situations, but they also may not. Highlighting these indicators in the box could lead some to think that all are associated with environmental factors all the time. Some people may just read the boxes and not all the text, so EPA should be careful in what message is highlighted in boxes throughout the document.
- In the box “Environmental Pollution and Disease: Selected Indicators” - same comment as above. Among those clearly environmentally related in the box (blood lead levels, cholera and typhoid fever prevalence) are these two: cardiovascular disease (CVD) mortality and chronic obstructive pulmonary disease (COPD) mortality. These are apples and oranges. CVD and COPD are HIGHLY related to lifestyle (diet and exercise/obesity and smoking respectively).

- Cholera and typhoid fever are exceedingly rare, if non-existent in the U.S. These are not useful indicators.
- Disinfection by-products can be formed when water is treated with any disinfectant. Singling out chlorine is unwarranted.

Susceptible Populations/Environmental Justice

- The report should describe environmental exposures in terms of the risk “audiences” (e.g., Native American communities that subsist on fish from polluted waters).
- The children’s environmental health indicators miss the mark. Should replace childhood asthma mortality and childhood asthma prevalence (these are not necessarily environmentally linked) with something like hospital visits due to asthma triggers. Similarly children’s exposure to pesticides and hospital visits.
- Information on environmental justice (e.g., exposure levels for sensitive populations) appears to be minimal or, in some areas, missing. This information should be included in future reports. Data could be used from other agencies such as HUD (e.g., on sub-standard housing). There could be something in each chapter such as vulnerable populations.
- Health disparities should be reported (e.g. vulnerable populations). There is some discussion about race under various diseases, but more information about poor or disadvantaged populations and disparities in health relative to where people live would be useful.
- Information on environmental justice (e.g., exposure levels for sensitive populations) appears to be minimal or, in some areas, missing. This information should be included in future reports. (2 comments)
- There is nothing in the ROE about environmental justice. The EPA may consider waiting for the new census information as it is information germane to this report. It would help if the ROE broke environmental effects down by socioeconomic status.
- The discussion of childhood cancer is misleading and should include additional studies (see E-Docket detailed comments).
- EPA should consider additional data sources in the discussion of childhood asthma (see E-Docket comments).
- The ROE should clarify that there are no reliable estimates for the prevalence of autism in the U.S. today (see E-Docket comments).
- More discussion should be included on the complexity of racial and ethnic sub-populations and their environmental exposures.
- Acknowledgment should have been made more directly to the differential risk that longevity may create, especially given the focus on chronic, mostly middle-age adult

diseases.

Lead

- The overall description of lead is too focused on the 1970's and air pollution. There are (at least) two separate issues—one is exposure to lead through air (which EPA has done a good job of addressing), the other is exposure through other sources such as paint.
- Childhood lead poisoning should be discussed as a disease rather than exposure—this is how it is referred to in public health circles.

Miscellaneous

- Include obesity.
- Wildlife diseases are important to report, as well as human diseases (e.g., Chronic Wasting Disease, West Nile Virus, endocrine disruptors).
- It should be clarified whether the exposure to radiation includes UV radiation.
- The asthma discussion should include other environmental contributors, such as cockroaches and dust mites.
- Information on the health effects of asbestos exposure should be included.
- The ROE does not discuss neurological disorders, which would be an appropriate part of this document.
- PBT's should be considered a human health indicator.
- In discussing “Biomonitoring Indicators,” EPA states that the term “body burden” has entered common usage, but this is not a scientific term and is value laden. It should be replaced with “biomonitoring information.”
- A surprising omission is the role of newer monitoring technologies and physiologic or genetic technologies (toxico-genomics) to the development of measures that will actually protect human health.

Approaches

- The inclusion of human health sections in all of the chapters underscores the relationship and integration of environmental and human health conditions. On the other hand - it means someone must read the entire report to fully appreciate the nature of environmental impacts on human health, and it also gives the impression that the Human Health Chapter is “searching for something new to say.”
- In the health section, there is no difference between the indicators and the questions. This is the only chapter where this is the case.

- Collaboration with the Department of Health and Human Services and CDC for future reports would be helpful. Some of the health data are inconsistent. More data, more examples, and “tighter” examples of human health issues such as asthma or pesticide exposures are needed.
- Expand the current cooperative agreement concept to other agencies, such as CDC and health departments, so that a broader set of agencies would be collecting consistent data in a consistent manner.
- The Wisconsin Department of Health and Family Services has indicators on exposure that may be useful.
- National Health and Nutrition Examination Survey (NHANES) data should be included in the next report.
- The indicator effort being undertaken by the Council of State and Territorial Epidemiologists (and other indicator efforts) should be crosswalked and coordinated with the EPA’s Environmental Indicator Initiative.
- The health standard data are problematic. You could have several days per year where the standard is moderately exceeded, and that would not be a significant problem, but hitting one day when the standard is significantly exceeded would be a real problem. Therefore, indicators that just focus on “number of days exceeded,” etc., can be very misleading. There is also an argument for just providing the data on ambient conditions, which are what the health effects, standards-based or not, are relying on. It is simply important to ask why there is a standard in the first place and then decide on what data to include. Given that standards don’t capture individual responses and total loads with other pollutants, it would be better to simply include information on pollutant levels so that the scientists can make their own comparisons and draw more scientifically-based conclusions.
- The NHANES exposure data are not the best data available. Other data sources should be considered and used.
- Include information on the cost of addressing health problems. If people see how much health care is costing, they will understand that action is needed.
- The human health chapter purports that there is a relationship between human health and exposure to pollutants. While this may be the case, it is important for the report to also include information on the effects of other factors (e.g., nutrition) which in many instances are likely to have a bigger influence on human health. The other factors should not simply be ignored.
- The cross-link between human health and other chapters seems to be missing completely. For instance, the mercury in air ends up in fish, which are consumed by humans (and other animals).
- To add to the usefulness of the report, the relationship between environmental factors and human health could be further developed. Mortality is a function of health care, not the

environment. Childhood cancer deaths are not due to the environment.

- There is no discussion in the human health chapter about time frames and the relationship to indicators. For instance, exposure to carcinogens and latency periods are not discussed. This would be important to managers and policy makers.
- There is an animal cancer registry at Georgetown University. It is interesting because animals don't have lifestyle factors that influence the cancer rate. This may be something that should be included in the ROE.
- The chosen indicators in the Human Health chapter seem to spin the information. Why are half of the indicators about infectious diseases? The focus should be on chronic diseases.
- Death rates are not a useful indicator—there are too many spurious effects such as access to care, treatment, screening, etc. Details about specific cancers (e.g., breast, testicular) and their connection to the environment would be better.
- The report should address issues that average people are exposed to and should present data as actual numbers with the implications described. This would be better than saying “meets standards.” For example, with drinking water standards, there may be health risks for some people even with current standards.
- The ROE needs to have a more thoughtful expression of human health. For instance, the World Health Organization (WHO) definition of health is an option. The WHO definition of human health is a combination of mind, body, and spirit.
- EPA should discuss more of the limitation of biomonitoring information, such as the fact that biomonitoring information alone does not tell us anything about the source of the exposure or the timing, magnitude, duration, or frequency of exposure.
- The use of the term “exogenous agent” is inappropriate and somewhat misleading when discussing endocrine disruptors. Endogenous substances are to be evaluated as endocrine disruptors.
- EPA is using the term “endocrine disruptor” as if it were a classification for a toxicological endpoint. This is not the case. Endocrine disruption describes a mechanism of action by which exposure to a substance induces an adverse effect.
- Exhibit 4-1 in the Technical Report would be useful to include in the Public Report as it introduces the environmental public health risk paradigm in a way that makes clear the differences between bio-monitoring indicators and outcome indicators.
- The case studies (e.g., lead, London “fog,” and typhoid need a brief preamble to explain their current relevance.
- The chapter falls short in discussing current environmental health concern. (See E-Docket for more details).
- The waterborne disease outbreaks are in the Human Health chapter of the Technical Report and the Water chapter of the Public Report. They are more appropriately included

in the Water chapter. The Human Health chapter could be expanded to discuss a few relevant contemporary issues such as VOCs, POPs, or endocrine disruptors, which are not only addressed in a real way in the Technical Report.

ECOLOGICAL CONDITION

Species/Species Condition

- The ROE should address loss of fish species.
- The ROE should give more than just bird examples, perhaps insects, aquatic species, etc.
- There should be an indicator of how many fish ladders have been built and how many miles of river are available for fish. There may be a need to re-colonize some areas.
- It would add understandability if the report presented keystone species or indicator species, especially those that would resonate with the general public such as bald eagles.
- Identify keystone species that the public really cares about and discuss their condition and whether things are getting better.
- A new indicator might be something about condition of aquatic life (e.g., fish lesions, deformed frogs). But the public would need to understand the causes of these conditions.
- Discussion on the abundance of healthy fish and wildlife communities should be included in the report.
- The rate of specific loss might be considered.
- The graph on page 5-8 of the public document shows the imperiled species by ecosystem and shows that the farmlands don't have imperiled species and this isn't true.
- The ROE should/could potentially use species as indicators.

Landscape/Habitat Condition/Extent

- Landscape conditions should be described, not just extent of landscapes. This should go beyond benthic community index, other invasive species (e.g., cheat grass, zebra mussels), and tree condition.
- More details on the extent of habitat would be useful.
- Fragmentation and habitat corridors should be considered.
- The forest section does not address nitrogen-based and ammonia-based deposition.
- Indices of healthy wildlife and their habitats, including community structure of plants and animals.

- Acres of wetlands lost, number of imperiled streams are most important.
- Habitat quality and biological indicators should be the highest priority indicators.
- The discussion about farmland ecosystems is “weird.” This feels like too much of an anthropogenic focus rather than an ecological discussion.

Invasive Species

- More examples of invasive species would be useful, including a chart that shows insects, aquatic, and plants and the issues in terms of public health and disease and habitats.
- Invasive species across all ecosystems should be addressed.
- Invasive species should be discussed in several chapters (e.g., land, water, and ecological condition) including the effect of these on various media, ecosystems, and industries (e.g., fishing).
- Invasive species should be part of an indexed negative indicator.

Ecological/Ecosystem Functions

- Function is important - are the wetlands functioning, not just how many acres exist.
- The ecological condition questions do not address how the function of the ecosystem has been affected (e.g., Is the health of the natural environment adequate to sustain what we do to it?). Current questions are very simplistic.
- Ecosystem functions - biodiversity and productivity are most important indicators
- Biotic function of aquatic systems (e.g., benthic organisms) is most important
- The EPA should consider consulting with the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) about “properly functioning conditions.”
- The ecological functions of the Ecological Condition chapter, contains no discussion about near-shore ecological function, e.g. shellfish production is down because of . . .
- The ROE should include a better understanding of what the impacts of native vegetation loss are on the Ecological Function.

Natural Disturbances

- The natural disturbance piece is difficult to read and understand. Is a northeast ice storm a “natural disturbance?”
- Climate change could be added to the natural disturbance section.
- In the natural disturbance section it would be possible to discuss different compounding

variables. For example, the Landers earthquake triggered an outbreak of Valley Fever. Windstorms raising dust in Southern California can affect health in Las Vegas. This involves meteorologists and biologists working together.

- Natural disturbances should include invasive species.

Oceans/Coastal Ecosystems

- A discussion of the coastal ecosystem is missing. The coastal Water Quality section talks only about estuaries and not the coast (where the majority of the population lives). With regard to coastal issues some of the things missing from the document are over-fishing, habitat loss, and habitat degradation.
- The discussion of Oceans is non-existent (even though it is 50% of the US). The small bit of mention ocean receives is not even in the water section. The inclusion of ocean indicators is very important. The U.S. Ocean Commission report has just been released and should be used as a resource.
- In the Ecological Condition chapter, there is discussion of erosion, but there is no discussion of physical processes on the beach.
- Coasts and oceans not being included is a glaring error. The marine ecosystem needs to be added.
- There are many coastal ecosystem indicators that should be included such as loss of sand, species presence, nearshore rocky reef habitat, etc.

Miscellaneous

- Erosion is covered in the soil section but not soil characteristics, such as pH, cation exchange capacity, and other aspects of soil chemistry.
- Indicators that track clean, potable water are most important.
- It is unclear what “chemicals” means in the indicator that refers to chemical contamination in urban streams.
- Animal health and related issues, such as population health and mutations, are only mentioned within the context of ecological condition. This is too far down the hierarchy of topics, even though these issues don’t need to be elevated to the level of human health.
- Sustainability and the health of forests, lands, activities, etc. (as they relate to our human needs) may not be easily quantified but are very important and are not sufficiently covered in the ROE.
- The ROE should include a discussion on coral reef systems.
- Monitoring spending on coastal erosion would be a good indicator.

- The Ecological Condition chapter should include a discussion of the impact of ozone on crops.

Approaches

- Exhibit 5-10 in Chapter 5 is a good graphic that shows linkages. More such as this would be useful.
- Exhibit 5-10 should go beyond fish to show effects on humans.
- There should be an explanation of how some times ecological indicators don't always agree.
- Additional descriptions of indicator methodology is needed to ensure that people understand how to interpret ecological indicators.
- Ecological health is most challenging. There are some global efforts (UN Millennium Assessment) that start with Landsat data. EPA could recommend how the nation should build a better data system for doing these types of assessments. It needs to be more than just scientists making these recommendations.
- Different ecological indicators - chemical, biological, physical, etc - may have different responses - so do not always agree with each other. This must be explained to the public.
- Chapter 5 (Ecological Condition) was a drastic change in format. It was hard to shift gears.
- EPA should use a model based on systems ecology for the next document, (e.g., how do the major pieces fit together?).
- General climate information is missing from the document, (e.g., rainfall, regional droughts, etc.).
- Many of the indicators are not really dealing with ecosystem health. They are looking more at static conditions of land or water. The report should take advantage of more of the indices that have been developed on ecosystem health (e.g., atmospheric heavy metal pollution, plant biodiversity, sources/sinks of nitrogen).
- In the Technical Document there should be more use of indices for plant and animal species.
- Key stressors and responses to those stressors that alter ecosystem processes (e.g., changes in land use, loss of ecosystems, air pollutants, exotic species, exacerbated natural stressors such as storms beyond their normal intensity and fire conflagrations).
- The spatial aspect of stressors should be brought out more. An option would be to create a regional matrix describing the spatial extent of data availability. This would be useful for investments and priority setting.

- There are many category 3 and 4 indicators [sic] in the Technical Document that merit attention, and if possible, additional funding, so that over time they can become category 1 and 2 indicators.
- If EPA were to work more closely with the natural resource agencies, additional biological data would probably be revealed, especially at the state level. In the Illinois State of the Environment reporting, biological data across ecosystems is a major gap. They have tried to use satellite data to address these gaps and are currently looking at various multi-metric approaches including birds and plants to correlate with human disturbances and stressors. There are 600 sites, of which, 150 are sampled annually. These are similar efforts to IBI - which are likely to be slightly different in every state. The states could work with EPA to define a common approach.
- The “master stations” approach, a sampling technique for a variety of parameters, could help with ecological monitoring. There are various national efforts that attempt to do this (e.g., EMAP and FIA) as well as state activities. Sometimes these sites are based on priority conditions and are not sampled consistently over time and results cannot be aggregated. There needs to be a multi-tiered approach to be able to track trends.
- The Texas Environmental Resource Stewards Group, an agency consortium with federal and state participation, is looking at rarity and diversity (both of which have standard metrics) as good ecological indicators. Perhaps EPA could use these as future indicators.
- The separation of water, wetlands, and ecological condition was difficult to understand. Ecological conditions are complex and interrelated with the other chapters. There isn't a lot of information in the Ecological Condition chapter. An option would be to create stories such as about cumulative impacts that link water, ecological conditions, and wetlands.
- There has been a lot of work done on phytoplankton that isn't included (see Chesapeake Bay studies).
- The biotic condition discussion seems like a random list. The ROE should look at things in a hierarchy using taxa as a guide. Look at what can and can't be measured based on data availability.
- Ecological footprinting is an approach that EPA might consider in developing indicators.
- The biotic indicators (reference 5-4 on page 5-7) reference information from the Heinz report. Referencing the source would be better.
- The ROE could have indicators that separate land and water flora and fauna. Both have their unique set of concerns. NatureServe is putting together a nationwide vegetation program, focusing on mapping plant communities. NatureServe may have other indicators that would be useful.
- The chemical section in ecological condition was difficult to understand and in its current form does not contribute to the document. If there were another way of describing this it would probably be useful.

- In the Land or Ecological Condition chapter the ROE should include information about the Endangered Species Act (ESA). Useful indicators for the ESA could include trend lines on listings and species at risk.
- The ROE should include information on traditional ecological knowledge.
- A more thoughtful definition of what is meant by ecological health is needed.
- Sources used in the ROE limit the potential outcome of the report. The ROE uses only government indicators and some of the best coastal data live in state and private databases. People for Puget Sound contains one of the best inventories of habitat information of marine ecology in the Pacific Northwest.
- On a national level, the Nature Conservancy has begun ‘bio-regional’ mapping and this is a great data set the ROE should use.
- Looking at trends in biodiversity can be very important and the ROE would benefit from this discussion.
- To the extent that a case can be made that the nation (and the entire world) is composed of interconnected sets of ecosystems, focusing on overall ecosystem health is a viable and potentially very useful approach for assessing and managing the environmental conditions within which we live and work.

OVERALL REPORT ORGANIZATION (presented in no specific order)

- The report should contain environmental citizenship measures (e.g., general environmental knowledge, per capita energy use, water use, recycling habits, etc.).
- The report could be organized in different ways to manage the number of indicators. These might include by ecosystem structure and function (e.g., media, processes, stressors), by biomes (e.g., grasslands or estuaries), or by stressors (e.g., urbanization, air pollution, changed ecological conditions).
- Link administrative and outcome indicators to show performance changes. Indicators should be chosen relative to EPA goals.
- The document should present EPA’s goals to provide a context for the indicators (e.g., what percentage of coastal waters are meeting national standards?).
- Think about indicators that will help change behavior. Many indicators are lagging (after the fact), but they are a useful place to start. Have to find indicators that “lead” (e.g., in private industrial context - a good measure is number of employees trained in safety). Need to take a long term look on what it will take to change environmental behavior.
- There is value in a national report, but state and local information should be coordinated. This includes how the indicators are organized. There is a lot of theoretical work published on indicator models [e.g., the Drivers-Pressures-State-Impact-Response

(DPSIR) framework]. Many groups are using the DPSIR model. EPA should make sure that its indicator framework is compatible with these and other efforts.

- No specific recommendations on which are less important, but a smaller number would be much better. A lot should be taken out (e.g., anything dealing with extent or weights - e.g., acres of grasslands or tons of emissions).
- As many indicators as possible (do not try to delete indicators) - as “drill down” to local levels, more will likely be necessary.
- A comprehensive index of environmental quality overall is important.
- Everything is important. But information should be organized around biomes or ecoregions - broad statements about general land/water quality nationally are not useful.
- Indicators that can be compared to national goals or conditions are most important.
- Indicators related to EPA’s responsibilities (but consider performance not just compliance) - address goals such as swimmable, fishable, drinkable.
- Do not force all indicators at a national level - focus on what is important/appropriate regionally/locally.
- Indicators that can be reported with actual numbers to show trends, rather than quality assessments, especially if these can be compared to national goals. Measures of the ambient environment.
- Report should address Puerto Rico, Alaska, and Hawaii.
- The ROE must talk about how the indicators change over time (this could potentially be part of the QA/QC criteria for indicators). Indicators must be sustainable and consistent over time to allow for long term trend information. The bottom line is being able to use indicators for trend analysis and there has to be consensus between states and EPA on what the right indicators are. The process should also acknowledge that you may not be able to identify national indicators in all areas. Finally, the indicator development process should consider that the ecological condition indicators are the end goal and that it takes a substantial effort to get to these.
- The order of the chapters is wrong. The Ecological Condition and Human Health Chapters should be at the front. Humans are part of the environment and should be described as such. Then the stressors can be described. (Two participants made this comment.)